លីមីត

1216 limits

ភាគ៣

$$\lim_{x \to 0} \left(x ! \right)^{\frac{1}{x}}$$

ចងក្រង និង រៀបរៀងដោយ ស៊ីម សេងគា

ចូរគណនាលីមីតខាងក្រោម ៖

1) $\lim\limits_{x\to 0}\dfrac{x\left(1-\cos x\right)}{x^2+x-e^x.\sin x}=-\dfrac{3}{2}$

2) $\lim\limits_{x\to 1}\dfrac{\sin\left(\pi x\right)+\pi x-\pi}{\cos\left(\dfrac{\pi}{2}x\right)+\dfrac{\pi}{2}x-\dfrac{\pi}{2}}=8$

3) $\lim\limits_{x\to +\infty}\sqrt[x]{x}=1$

4) $\lim\limits_{x\to 1}\left(2-x\right)^{\tan\left(\frac{\pi x}{2}\right)}=e^{\frac{2}{\pi}}$

5) $\lim\limits_{x\to 0}x^{\ln\left(1+\frac{x}{\ln x}\right)}=1$

6) $\lim\limits_{x\to 0}\dfrac{\ln\left(1+\sin x\right)}{\ln\left(1-\sin x\right)}=-1$

7) $\lim\limits_{x\to \infty}\left(\dfrac{1-2x}{x+2}+\sqrt{x^2+6x}-x\right)^x=e^{-\frac{3}{2}}$

8) $\lim\limits_{x\to \infty}x\left[\arctan\left(\dfrac{x+1}{x+2}\right)-\dfrac{\pi}{4}\right]=-\dfrac{1}{2}$

9) $\lim\limits_{x\to 1}\left(\dfrac{1}{x-1}-\dfrac{x}{\ln x}\right)=-\dfrac{3}{2}$

10) $\lim\limits_{x\to 1}\left(\dfrac{x^2-3x+3}{2x-1}\right)^{\frac{1}{x-1}}=e^{-3}$

11) $\lim\limits_{x\to 0}\left(\cos x + a\sin x\right)^{\frac{1}{x}} = e^{a}$

12) $\lim\limits_{x\to 1}\left[\ \tan\left(\frac{\pi x}{4}\right)\ \right]^{\tan\left(\frac{\pi x}{2}\right)} = \frac{1}{e}$

13) $\lim\limits_{x\to \frac{\pi}{6}} \frac{2\sin x - 1}{2\cos x - \sqrt{3}} = -\sqrt{3}$

14) $\lim\limits_{x\to 0} \frac{64^{x} - 3\times 48^{x} + 3\times 36^{x} - 27^{x}}{x^{3}} = \ln^{3}\left(\frac{4}{3}\right)$

15) $\lim\limits_{x\to \frac{1}{\sqrt{2}}} \frac{\arcsin x - \arccos x}{\sqrt{2}x - 1} = 2$

16) $\lim\limits_{x\to \frac{\pi}{2}} \frac{\left(1-\sqrt{\sin x}\right)\left(1-\sqrt[3]{\sin x}\right)\times\cdots\times\left(1-\sqrt[2020]{\sin x}\right)}{\left(1-\sin x\right)^{2019}} = \frac{1}{2020!}$

17) $\lim\limits_{x\to 0} \frac{\tan 2x - 2\sin x}{x^{3}} = 3$

18) $\lim\limits_{x\to 0} \frac{\ln\left(1+x\right) - \sin x}{x\sin x} = -\frac{1}{2}$

19) $\lim\limits_{x\to 0} \sqrt[x]{\cos\left(\sqrt{x}\right)} = \frac{1}{e}$

20) $\lim\limits_{x\to 1^{+}} \frac{\left(\sqrt{x}\right)^{x} - 1}{x-1} = \frac{1}{2}$

21) $\lim\limits_{x\to \pi} \frac{\left(1+\cos x\right).\cot x}{x-\pi} = -\frac{1}{2}$

22) $\lim\limits_{n\to\infty}\left[\dfrac{n!}{\left(mn\right)^{n}}\right]^{\frac{1}{n}}=\dfrac{1}{em}$

23) $\lim\limits_{x\to\infty}\left\{\cos\left[2\pi.\left(\dfrac{x}{x+1}\right)^{a}\right]\right\}^{x^{2}}=e^{-2a^{2}\pi^{2}}$

24) $\lim\limits_{x\to 2}\dfrac{3^{\log_2 x}-3}{x^{4}-16}=\dfrac{3}{64}\log_2 3$

25) $\lim\limits_{x\to 0}\left[\dfrac{\left(1+x\right)^{\frac{1}{x}}}{e}\right]^{\frac{1}{x}}=\dfrac{1}{\sqrt{e}}$

26) $\lim\limits_{x\to 0}\dfrac{e^{x}+e^{-x}-2}{x^{2}}=1$

27) $\lim\limits_{x\to 0}\dfrac{e^{x}-x-1}{x^{2}}=\dfrac{1}{2}$

28) $\lim\limits_{n\to\infty}\left(\dfrac{1}{n^{2}}+\dfrac{2}{n^{2}}+\dfrac{3}{n^{2}}+\cdots+\dfrac{n-1}{n^{2}}\right)=\dfrac{1}{2}$

29) $\lim\limits_{x\to\infty}\left(\dfrac{x^{2}+5x+4}{x^{2}+x+3}\right)^{x}=e^{4}$

30) $\lim\limits_{x\to 0}\dfrac{27^{x}-9^{x}-3^{x}+1}{\sqrt{2}-\sqrt{1+\cos x}}=8\sqrt{2}\,.\ln^{2}3$

31) $\lim\limits_{x\to\infty}\left(\dfrac{2^{\frac{1}{x}}+3^{\frac{1}{x}}+\cdots+10^{\frac{1}{x}}}{9}\right)^{9x}=10!$

32) $\lim\limits_{x\to 0}\dfrac{\left(1+x+\sin x\right)^{\frac{1}{n}}-1}{x+\sin x}=\dfrac{1}{n}$

33) $\lim\limits_{x\to 1}\left(2-x\right)^{\tan\left(\frac{\pi x}{2}\right)}=e^{\frac{2}{\pi}}$

34) $\lim\limits_{x\to\frac{\pi}{2}}\left(\sin x\right)^{\frac{1}{\cos x}}=1$

35) $\lim\limits_{x\to 0}\dfrac{\ln\left(\dfrac{a+bx}{a+cx}\right)}{x}=\dfrac{b-c}{a}$

36) $\lim\limits_{x\to 0}\dfrac{\sin\left(\tan x\right)-\tan\left(\sin x\right)}{x-\sin x}=0$

37) $\lim\limits_{x\to 0}\dfrac{\ln\left(\cos x\right)}{\ln\left(\cos 3x\right)}=\dfrac{1}{9}$

38) $\lim\limits_{x\to 0}\dfrac{e-\left(1+x\right)^{\frac{1}{x}}}{\tan x}=\dfrac{e}{2}$

39) $\lim\limits_{x\to 2}\left(3-x\right)^{\frac{2}{3x-6}}=\dfrac{1}{\sqrt[3]{e^{2}}}$

40) $\lim\limits_{x\to 0}\dfrac{\arctan x-\arcsin x}{\tan x-\sin x}=-1$

41) $\lim\limits_{x\to 0}\dfrac{2-2\cos x-x^2}{x^4}=-\dfrac{1}{12}$

42) $\lim\limits_{x\to \frac{\pi}{4}}\dfrac{\frac{1}{e}-e^{\tan x-2}}{\ln\left(\cot x\right)}=\dfrac{1}{e}$

43) $\lim\limits_{x\to 0}\dfrac{e^x+e^{-x}-2}{1-\cos 2x}=\dfrac{1}{2}$

44) $\lim\limits_{x\to \infty}\dfrac{x^3\sin\left(\dfrac{1}{x}\right)+x+1}{x^2+x+1}=1$

45) $\lim\limits_{x\to 0}\dfrac{27.\sqrt[3]{x+1}+3x^2-9x-27}{x^3}=\dfrac{5}{3}$

46) $\lim\limits_{x\to 4}\dfrac{\ln x-\ln 4}{x-4}=\dfrac{1}{4}$

47) $\lim\limits_{x\to \frac{1}{\sqrt{2}}}\dfrac{\sin^{-1}x-\cos^{-1}x}{\sqrt{2}x-1}=2$

48) $\lim\limits_{x\to 2^-}\dfrac{x-2\cos\left(\sqrt{2-x}\right)}{\left(2-x\right)^2}=-\dfrac{1}{12}$

49) $\lim\limits_{x\to 1}\left(\tan\dfrac{\pi x}{4}\right)^{\tan\left(\frac{\pi x}{2}\right)}=\dfrac{1}{e}$

50) $\lim\limits_{x\to 0}\dfrac{xe^x-e^x+1}{x\left(e^x-1\right)}=\dfrac{1}{2}$

51) $\lim\limits_{x\to\frac{\pi}{2}}\left(\sin x\right)^{\frac{1}{\cos x}}=1$

52) $\lim\limits_{x\to 1}x^{\cot(\pi x)}=e^{\frac{1}{\pi}}$

53) $\lim\limits_{x\to 0}\left(1-2x\right)^{\frac{1}{x}}=e^{-2}$

54) $\lim\limits_{x\to 0}\dfrac{e^{x}-e^{-x}-2x}{x-\sin x}=2$

55) $\lim\limits_{x\to 0}\dfrac{1-\cos x\,.\sqrt{\cos 2x}}{x^{2}}=\dfrac{3}{2}$

56) $\lim\limits_{x\to 0}\dfrac{1-\sqrt[6]{\cos 2x}}{x^{2}}=\dfrac{1}{3}$

57) $\lim\limits_{x\to 0}\dfrac{4x\left(\tan x-\sin x\right)}{\left(1-\cos 2x\right)^{2}}=\dfrac{1}{2}$

58) $\lim\limits_{x\to 1}\left(\dfrac{1}{\ln x}-\dfrac{1}{1-x}\right)=\dfrac{1}{2}$

59) $\lim\limits_{x\to\frac{\pi}{3}}\dfrac{\tan x-\sqrt{3}}{\cos x-\sin\left(\dfrac{x}{2}\right)}=-\dfrac{16}{3\sqrt{3}}$

60) $\lim\limits_{x\to\frac{\pi}{4}}\dfrac{\ln\left(\tan x\right)}{x-\dfrac{\pi}{4}}=2$

61) $\lim\limits_{x\to\infty}\left(\dfrac{x+8}{x-2}\right)^{x}=e^{10}$

62) $\lim\limits_{n\to\infty}\left(\dfrac{n!}{n^n}\right)^{\frac{1}{n}}=\dfrac{1}{e}$

63) $\lim\limits_{x\to\pi}\dfrac{1-\sin\dfrac{x}{2}}{x-\pi}=0$

64) $\lim\limits_{x\to 0}\left(\dfrac{a^x+b^x+c^x}{3}\right)^{\frac{1}{x}}=\left(abc\right)^{\frac{2}{3}}$

65) $\lim\limits_{x\to 0}\dfrac{\sqrt[m]{1+ax}.\sqrt[n]{1+bx}-1}{x}=\dfrac{a}{m}+\dfrac{b}{n}$

66) $\lim\limits_{x\to 1^+}\dfrac{\left(x^{2020}-1\right)^2}{\ln^2 x}=2020^2$

67) $\lim\limits_{x\to\frac{\pi}{2}}\dfrac{\sin x-\left(\sin x\right)^{\sin x}}{1-\sin x+\ln\left(\sin x\right)}=2$

68) $\lim\limits_{x\to\infty}x^2\sin\left[\ln\left(\sqrt{\cos\dfrac{\pi}{x}}\right)\right]=-\dfrac{\pi^2}{4}$

69) $\lim\limits_{x\to 0}\sqrt{\dfrac{x\sin x}{x+\sin^2 x}}=0$

70) $\lim\limits_{x\to 1}\dfrac{1-x+\ln x}{1+\cos\left(\pi x\right)}=-\dfrac{1}{\pi^2}$

71) $\lim\limits_{x\to 0}\dfrac{e^{ix^2}-i\sin\left(x^2\right).\cos^2 x-1}{x^4}=-\dfrac{1}{2}+i$

72) $\lim\limits_{x\to 2}\dfrac{1-\sin\dfrac{\pi}{x}}{1-\cos\left(\pi x\right)}=\dfrac{1}{16}$

73) $\lim\limits_{x\to\infty}\left(\dfrac{x+4}{x-2}\right)^{x+3}=e^{6}$

74) $\lim\limits_{x\to a}\left(2-\dfrac{a}{x}\right)^{\tan\left(\frac{\pi x}{2a}\right)}=e^{-\frac{2}{\pi}}$

75) $\lim\limits_{x\to\infty}\left(\cos\dfrac{1}{x}+\sin\dfrac{1}{x^{2}}\right)^{x^{2}}=\sqrt{e}$

76) $\lim\limits_{x\to 0}\dfrac{\sqrt{\dfrac{1+x}{1-x}}.\sqrt[4]{\dfrac{1+2x}{1-2x}}.\sqrt[6]{\dfrac{1+3x}{1-3x}}-1}{x}=3$

77) $\lim\limits_{x\to 0}\left[\ \tan\left(\dfrac{\pi}{4}+x\right)\right]^{\frac{1}{x}}=e^{2}$

78) $\lim\limits_{x\to 0}\dfrac{\sqrt{1+x^{4}}+\sqrt[3]{8+2x^{4}}-\sqrt[3]{27-2x^{4}}}{\left(1-\cos 2x\right).\tan^{2}\left(\sin 3x\right)}=\dfrac{10}{243}$

79) $\lim\limits_{x\to\frac{\pi}{4}}\dfrac{\sqrt{2}-\cos x-\sin x}{\left(4x-\pi\right)^{2}}=\dfrac{\sqrt{2}}{32}$

80) $\lim\limits_{x\to 0}\dfrac{\ln\left(\dfrac{\sqrt{1-x^{2}}}{\cos x}\right)}{x^{3}}=0$

81) $\lim\limits_{x\to\frac{\pi}{2}}\dfrac{\cos 4x-\cos 2x-2}{\left(2x-\pi\right)^{2}}=-\dfrac{5}{2}$

82) $\lim\limits_{x\to 0}\dfrac{\ln\left(1+\tan x\right)}{\sin x}=1$

83) $\lim\limits_{x\to 0}\dfrac{2^{\sec x}-2^{\cos x}}{x^{2}}=2\ln 2$

84) $\lim\limits_{x\to \infty}\left(\dfrac{x^{2}+5x+4}{x^{2}-3x+7}\right)^{x}=e^{8}$

85) $\lim\limits_{x\to 2}\dfrac{\sqrt{2x-3}\,.\sqrt[3]{3x-5}\,.\sqrt[4]{4x-7}\,.\sqrt[5]{5x-9}\;-1}{x-2}=4$

86) $\lim\limits_{x\to \frac{\pi}{2}}\dfrac{\cos x}{\cos 3x}=-\dfrac{1}{3}$

87) $\lim\limits_{x\to \frac{\pi}{6}}\dfrac{\sin x-\dfrac{1}{2}}{6x-\pi}=\dfrac{\sqrt{3}}{12}$

88) $\lim\limits_{x\to 0}\dfrac{\sin 2x+\sin 4x-\tan 6x}{1-\cos x}=0$

89) $\lim\limits_{m\to \infty}\left(\cos\dfrac{x}{m}\right)^{m}=1$

90) $\lim\limits_{x\to \infty}x^{2}\tan^{-1}\left(\cos\dfrac{5}{x}-\cos\dfrac{2}{x}\right)=-\dfrac{21}{2}$

91) $\lim\limits_{x\to 0}\dfrac{\cos\left(5\tan^{4}x-3\sin^{4}x\right)-\cos\left(5\tan^{4}x+3\sin^{4}x\right)}{x^{8}}=30$

92) $\lim\limits_{x\to 0}\dfrac{\cos x\,.\cos 2x\,.\cos 4x\,.\cos 8x-x\cot x}{x^{2}}=-\dfrac{253}{6}$

93) $\lim\limits_{x\to 0}\dfrac{1-\cos 3x}{1-\cos 4x}=\dfrac{9}{16}$

94) $\lim\limits_{x\to 0}\dfrac{1-\cos x\,.\cos 2x\,.\cos 3x}{x^{2}}=7$

95) $\lim\limits_{x\to 0}\dfrac{\cos x-\sqrt[3]{\cos x}}{\sin^{2}x}=-\dfrac{1}{3}$

96) $\lim\limits_{x\to \frac{\pi}{6}}\dfrac{2\cos 2x-1}{\cos 3x}=\dfrac{2}{\sqrt{3}}$

97) $\lim\limits_{x\to \infty}\left(\dfrac{x^{3}+x+1}{\sqrt[3]{x^{3}+x-1}}-\dfrac{x^{3}-x+1}{\sqrt[3]{x^{3}-x+2}}\right)=\dfrac{4}{3}$

98) $\lim\limits_{n\to \infty}\left(\dfrac{n+9}{n+10}\right)^{n}=\dfrac{1}{e}$

99) $\lim\limits_{x\to \frac{\pi}{4}}\dfrac{1-\sqrt{2}\sin x}{1-\sqrt{2}\cos x}=-1$

100) $\lim\limits_{x\to 1}\left(\dfrac{\pi}{4}-\tan^{-1}x\right).\tan\left(\dfrac{\pi}{x+1}\right)=-\dfrac{2}{\pi}$

101) $\lim\limits_{x\to 0}\dfrac{\left(2-x^{2}\right)\sin x-\sin 2x}{x^{5}}=-\dfrac{1}{12}$

102) $\lim\limits_{x\to 0}\left(\dfrac{1}{x\sin x}-\dfrac{1}{x^{2}}\right)=\dfrac{1}{6}$

103) $\lim\limits_{n\to \infty}\sqrt[n]{4^{n}+5^{n}}=5$

104) $\lim\limits_{x\to e}\dfrac{x-e\ln x}{\left(x-e\right)^2}=\dfrac{1}{2e}$

105) $\lim\limits_{x\to 0}\dfrac{\sin 3x+\sin 6x-\sin 9x}{81x^3}=1$

106) $\lim\limits_{x\to 3}\dfrac{3^x-27}{2^{x+1}-16}=\dfrac{27}{16}\log_2 3$

107) $\lim\limits_{n\to\infty}\dfrac{1}{n}\cdot\sqrt[n]{\dfrac{\left(2n\right)!}{n!}}=\dfrac{4}{e}$

108) $\lim\limits_{x\to 0}\dfrac{\ln\left(\dfrac{3-\cos 2x-2x^2}{2}\right)}{x^4}=-\dfrac{1}{3}$

109) $\lim\limits_{x\to\frac{\pi}{3}}\dfrac{\sin x-\sqrt{3}\cos x}{4x-\dfrac{4\pi}{3}}=\dfrac{1}{2}$

110) $\lim\limits_{x\to 0}\dfrac{e^{\frac{\tan^6 x}{6}}-e^{\frac{\sin^6 x}{6}}}{x^8}=\dfrac{1}{2}$

111) $\lim\limits_{x\to\frac{\pi}{4}}\dfrac{4\sqrt{2}-\left(\cos x+\sin x\right)^5}{1-\sin 2x}=5\sqrt{2}$

112) $\lim\limits_{x\to 6}\dfrac{1-\sqrt{3-\sqrt{x-2}}}{x-6}=\dfrac{1}{8}$

113) $\lim\limits_{x\to\infty}\left(\dfrac{4^{\frac{1}{x}}+5^{\frac{1}{x}}+6^{\frac{1}{x}}}{3}\right)^{3x}=120$

114) $\lim\limits_{x\to\infty}\left(\dfrac{x^2+4x+3}{x^2-2x+7}\right)^x = e^6$

115) $\lim\limits_{x\to 0}\dfrac{1-\sin\left(\dfrac{\pi}{2}\cos x+x\right)}{x^2} = \dfrac{1}{2}$

116) $\lim\limits_{x\to\frac{\pi}{6}}\dfrac{2\cos 2x-1}{\cos 3x} = \dfrac{2\sqrt{3}}{3}$

117) $\lim\limits_{x\to\infty}\left(\dfrac{x^2+5x+4}{x^2-3x+7}\right)^x = e^8$

118) $\lim\limits_{x\to 0}\sqrt[x]{1+\sin\left(1-\dfrac{e^x-1}{x}\right)} = \dfrac{1}{\sqrt{e}}$

119) $\lim\limits_{x\to 0}\dfrac{\ln\left[\left(\sin x+\cos x\right)^2\right]}{\sin 2x} = 1$

120) $\lim\limits_{x\to 1}\dfrac{\sin\left(2\ln x\right)-2\ln x}{\ln^3\left(x^4\right)} = -\dfrac{1}{48}$

121) $\lim\limits_{x\to\frac{\pi}{4}}\dfrac{\sqrt{2}-2\cos x}{\sqrt{2}-2\sin x} = -1$

122) $\lim\limits_{x\to 1}\dfrac{x\sqrt{x+3}-2}{x^2+x-2} = \dfrac{3}{4}$

123) $\lim\limits_{x\to 2}\dfrac{x^4.\sqrt{x+2}.\sqrt[3]{x+6}-64}{x-2} = \dfrac{416}{3}$

124) $\lim\limits_{x\to 0}\dfrac{\sin\left(\tan x\right)-\tan\left(\sin x\right)}{\sin x-\tan x}=0$

125) $\lim\limits_{x\to 0}\dfrac{\ln\left(2x^{2}+\cos 2x\right)}{x^{4}}=\dfrac{2}{3}$

126) $\lim\limits_{x\to 0}\dfrac{64^{x}-3\times 48^{x}+3\times 36^{x}-27^{x}}{x^{3}}=\ln^{3}\left(\dfrac{4}{3}\right)$

127) $\lim\limits_{x\to 0}\sqrt[x^{2}]{1+\sin\left(1-\dfrac{\sin x}{x}\right)}=\sqrt[6]{e}$

128) $\lim\limits_{x\to\frac{1}{3}}\dfrac{3x^{3}+2x^{2}+2x-1}{3x-1}=\dfrac{13}{9}$

129) $\lim\limits_{x\to\frac{\pi}{6}}\dfrac{1-\sqrt{3}\tan x}{\pi-6x}=\dfrac{2\sqrt{3}}{9}$

130) $\lim\limits_{n\to\infty}\left(\sqrt[3]{8^{n}+4^{n}+2^{n}}-2^{n}\right)=\dfrac{1}{3}$

131) $\lim\limits_{x\to 0}\dfrac{\tan x-\sin x}{x^{3}}=\dfrac{1}{2}$

132) $\lim\limits_{x\to 1}\dfrac{\left(2x+1\right)^{5}-243}{\left(x+1\right)^{6}-32}=\dfrac{135}{32}$

133) $\lim\limits_{x\to e}\dfrac{\ln x-1}{x-e}=\dfrac{1}{e}$

134) $\lim\limits_{x\to 1}\dfrac{\sin\left(\pi x\right)+\cos\left(\dfrac{\pi x}{2}\right)}{\left(1+3x\right)\cos\left(\dfrac{3\pi x}{2}\right)}=-\dfrac{1}{4}$

135) $\lim\limits_{x\to 0}\dfrac{\sqrt[3]{1+\tan x}-\sqrt[3]{1+\sin x}}{x^3}=\dfrac{1}{6}$

136) $\lim\limits_{x\to 0}\dfrac{x\cos x-\sin x}{x^3}=-\dfrac{1}{3}$

137) $\lim\limits_{x\to 0}\dfrac{x-\tan^{-1}x}{x^3}=\dfrac{1}{3}$

138) $\lim\limits_{x\to \frac{\pi}{4}}\dfrac{4\sqrt{2}-\left(\cos x+\sin x\right)^5}{2-\left(\cos x+\sin x\right)^2}=5\sqrt{2}$

139) $\lim\limits_{x\to 1}\dfrac{\sin\left(x^{2019}-1\right)}{x-1}=2019$

140) $\lim\limits_{x\to \frac{\pi}{4}}\dfrac{\tan x-1}{x-\dfrac{\pi}{4}}=2$

141) $\lim\limits_{x\to \frac{\pi}{2}}\left(\sin x\right)^{\tan x}=1$

142) $\lim\limits_{x\to 0}\dfrac{\left(x+1\right)^8-\left(x-1\right)^8}{\left(x+1\right)^5+\left(x-1\right)^5}=\dfrac{8}{5}$

143) $\lim\limits_{x\to 0}\dfrac{\cos x-\sqrt[3]{\cos x}}{\sin^2 x}=-\dfrac{1}{3}$

144) $\lim\limits_{x\to\frac{\pi}{4}} \dfrac{\cos 2x}{1-\tan x} = 1$

145) $\lim\limits_{x\to+\infty} \left[\sin\left(\dfrac{\pi x+4}{2x+3}\right) \right]^{\frac{x^2}{1+2x}} = 1$

146) $\lim\limits_{x\to\frac{\pi}{2}} \dfrac{2-\cos^2 x+2\sin x}{\left(x+\dfrac{\pi}{4}\right)^4} = \dfrac{1}{4}$

147) $\lim\limits_{x\to 1} \sqrt[x-1-\ln x]{\sin\left(\dfrac{\pi}{2}x\right)} = e^{-\frac{\pi^2}{4}}$

148) $\lim\limits_{x\to 0} \dfrac{e^{10x}-x-1}{e^{5x}-2x-1} = 3$

149) $\lim\limits_{x\to 0} \dfrac{5x-\cos\left(5\cos^{-1}x\right)}{5x+\sin\left(5\sin^{-1}x\right)} = 0$

150) $\lim\limits_{x\to 0} \dfrac{x\left(1-\cos x\right)}{x^2+x-e^x.\sin x} = -\dfrac{3}{2}$

151) $\lim\limits_{x\to 0} \left[\dfrac{2}{\sin^2 x} + \dfrac{1}{\ln\left(\cos x\right)} \right] = 1$

152) $\lim\limits_{x\to 0} \left(e^x+x\right)^{\frac{2}{x}} = e^4$

153) $\lim\limits_{x\to 1} \dfrac{\sin\left[\pi-\cos^4\left(\dfrac{\pi x}{2}\right)\right]}{e^{1-\sin\left(\frac{\pi x}{2}\right)}+e^{\sin\left(\frac{\pi x}{2}\right)-1}-2} = 4$

154) $\lim\limits_{x\to 0}\left(\dfrac{x^2+x+1}{x^2-x+1}\right)^{-\csc x} = e^{-2}$

155) $\lim\limits_{x\to 0}\dfrac{x-\sin x}{x^3} = \dfrac{1}{6}$

156) $\lim\limits_{x\to 0}\dfrac{\sin^{-1}x-\sin x}{\left(\sin^{-1}x\right)^3} = \dfrac{1}{3}$

157) $\lim\limits_{x\to \frac{\pi}{4}}\dfrac{1-\sqrt{2}\sin x}{1-\sqrt{2}\cos x} = -1$

158) $\lim\limits_{x\to 0}\left(\dfrac{e^x+e^{-x}-2}{x^2}-1\right) = 0$

159) $\lim\limits_{x\to 0}\dfrac{1-\cos\left(e^x-1\right)}{\sin\left(\sqrt{x}\right)} = 0$

160) $\lim\limits_{n\to\infty}\sqrt[n]{\dfrac{\left(3n\right)!}{\left(2n\right)!.n^n}} = \dfrac{27}{4e}$

161) $\lim\limits_{x\to 0}\dfrac{\ln\left(2+x\right)-x}{x^2} = -\dfrac{1}{2}$

162) $\lim\limits_{x\to a}\dfrac{\sqrt{2a^3x-x^4}-a.\sqrt[3]{a^2x}}{a-\sqrt[4]{ax^3}} = \dfrac{4}{3}a$

163) $\lim\limits_{x\to \frac{\pi}{2}}\left(\dfrac{2\sec^2 x-3}{2\sec^2 x-\sec x+1}\right)^{\frac{\sin^2 x}{\cos x}} = e^{\frac{1}{2}}$

164) $\lim\limits_{x\to\infty}\left(\sqrt[3]{8^x+3^x}-\sqrt{4^x-2^x}\right)=\dfrac{1}{2}$

165) $\lim\limits_{x\to\frac{\pi}{3}}\left(\dfrac{2\sqrt{3}\sin x-1}{1+2\cos x}\right)^{\frac{1}{\pi-3x}}=e^{-\frac{\sqrt{3}}{3}}$

166) $\lim\limits_{x\to 0}\left[\ \ln\left(x^2+e\right)\ \right]^{\frac{1}{\cos x-1}}=e^{-\frac{2}{e}}$

167) $\lim\limits_{x\to\frac{\pi}{4}}\left(\sin 2x\right)^{\tan^2\left(2x\right)}=\dfrac{1}{\sqrt{e}}$

168) $\lim\limits_{x\to 0}\dfrac{\left(1+x\right)\left(1+2x\right)\left(1+3x\right)\left(1+4x\right)\left(1+5x\right)-1}{\tan 5x}=3$

169) $\lim\limits_{x\to 0^+}\left(e^x+x\right)^{\frac{2}{x}}=e^4$

170) $\lim\limits_{x\to 0}\dfrac{\sin\left(e^{2x}-1\right)}{\sin\left(e^x-1\right)}=2$

171) $\lim\limits_{x\to 0}\dfrac{\dfrac{x}{\sin x}-2+\dfrac{\sin x}{x}}{x^4}=\dfrac{1}{36}$

172) $\lim\limits_{x\to\frac{\pi}{3}}\dfrac{\sin\left(x-\dfrac{\pi}{3}\right)}{1-2\cos x}=\sqrt{3}$

173) $\lim\limits_{x\to 1}\left[\ 2+\cos\left(\pi x\right)\ \right]^{\frac{1}{x^3-3x+2}}=e^{\frac{\pi^2}{6}}$

174) $\lim\limits_{x\to 0}\dfrac{\ln\left(e+x\right)-\ln\left(e-x\right)}{x}=\dfrac{2}{e}$

175) $\lim\limits_{n\to\infty} n.\tan^{-1}\left[\dfrac{1}{\left(x^2+1\right)n+1}\right]\cdot\left[\tan\left(\dfrac{\pi}{4}+\dfrac{x}{2n}\right)\right]^n=\dfrac{e^x}{x^2+1}$

176) $\lim\limits_{x\to\infty}\left(\dfrac{x^2+1}{x^2-1}\right)^{\left(x^4-1\right)\sin^2\left(\frac{1}{x}\right)}=e^2$

177) $\lim\limits_{x\to 0}\dfrac{\tan\left(10x\right)+x^{2018}}{\tan 5x}=2$

178) $\lim\limits_{x\to 0}\dfrac{\sin 3x+\sin 6x-\sin 9x}{x^3}=81$

179) $\lim\limits_{x\to\frac{\pi}{4}}\dfrac{\sec^2 x-2\tan x}{\left(x-\dfrac{\pi}{4}\right)^2}=4$

180) $\lim\limits_{x\to 0}\dfrac{\sqrt{1+4x}-1}{1-\sqrt[3]{1+x+x^2}}=-6$

181) $\lim\limits_{x\to 1}\dfrac{\ln\left(\left(\tan\left(\pi\sec\left(\pi x\right)\right)\right)+1\right)}{e^{x-1}-x}=-\pi^3$

182) $\lim\limits_{x\to 0^+}\dfrac{\left(\sec x\right)^{\sec x}-\left(\cos x\right)^{\cos x}}{x^2}$

183) $\lim\limits_{x\to 0}\left(\dfrac{3-\cos x}{2-\cos x}\right)^{\cot^2\left(2x\right)}=e^{\frac{1}{8}}$

184) $\lim\limits_{x\to 0}\dfrac{\sin x-2\sin\dfrac{x}{2}+8\sin^3\left(\dfrac{x}{4}\right)}{x^5}=\dfrac{1}{256}$

185) $\lim\limits_{x\to 0}\dfrac{\tan^2 x+2\ln\left(\cos x\right)}{\sin^2 x-\ln\left(1+\sin^2 x\right)}=1$

186) $\lim\limits_{x\to 0}\dfrac{\left(1-\cos x\right)\sqrt{1+\cos x}-2\sqrt{2}\sin^2\left(\dfrac{x}{2}\right)}{x^4}=-\dfrac{\sqrt{2}}{16}$

187) $\lim\limits_{x\to\frac{\pi}{3}}\dfrac{\tan^3 x-3\tan x}{\cos\left(x+\dfrac{\pi}{6}\right)}=-24$

188) $\lim\limits_{x\to 0}\dfrac{5e^{5x}-e^{4x}-e^{3x}-e^{2x}-e^{x}-1}{x}=15$

189) $\lim\limits_{x\to 0}\dfrac{4\times 81^{x}-27^{x}-9^{x}-3^{x}-1}{1-\sqrt[3]{1+x+x^2}}=-30\ln 3$

190) $\lim\limits_{x\to 0}\dfrac{\ln\left[\left(1+x\right)^2\right]-2x}{x^2}=-1$

191) $\lim\limits_{x\to 1}\sqrt[x-1-\ln x]{\sin\left(\dfrac{\pi x}{2}\right)}=e^{-\frac{\pi^2}{4}}$

192) $\lim\limits_{x\to 1}\dfrac{\ln x}{\tan\left(\pi x\right)}=\dfrac{1}{\pi}$

193) $\lim\limits_{x\to 0}\dfrac{\cos x-\dfrac{1-\dfrac{5}{12}x^2}{1+\dfrac{1}{12}x^2}}{x^6}$

194) $\lim\limits_{x\to 0}\dfrac{12-6x^2-12\cos x}{x^4}=-\dfrac{1}{2}$

195) $\lim\limits_{x\to \infty} x\left[\dfrac{\pi}{4}-\tan^{-1}\left(\dfrac{x}{x+1}\right)\right]=\dfrac{1}{2}$

196) $\lim\limits_{x\to 0}\dfrac{\sin^2 x-\sin^2\left(2x\right)+3x^2}{x^4}=5$

197) $\lim\limits_{x\to 1}\dfrac{3\sin\left(\pi x\right)-\sin\left(3\pi x\right)}{\left(x-1\right)^3}=-4\pi^3$

198) $\lim\limits_{x\to 2}\dfrac{\cos\left(\dfrac{3\pi}{x}\right)}{x-2}=-\dfrac{3\pi}{2}$

199) $\lim\limits_{x\to 0}\dfrac{\ln\left(x^2+x+1\right)}{x}=1$

200) $\lim\limits_{x\to 0}\left(e^x+e^{-x}-1\right)^{\frac{1}{x^2}}=e$

201) $\underset{x\to 0}{Lt}\dfrac{e^x-\ln\left(ex+e\right)}{x}=0$

202) $\lim\limits_{x\to 0}\dfrac{\left(1+x+x^2\right)-e^x}{x^2}=\dfrac{1}{2}$

203) $\lim\limits_{x\to 0}\dfrac{e^{x}-e^{-x}-2x}{x-\sin x}=2$

204) $\lim\limits_{x\to 0^{+}}\dfrac{e^{x^{x}-1}-x^{x}}{\left[\left(x^{2}\right)^{x}-1\right]^{2}}=\dfrac{1}{8}$

205) $\lim\limits_{x\to 0}\left(\dfrac{e^{x}+e^{-x}-2}{x^{2}}\right)^{\frac{1}{x^{2}}}=e^{\frac{1}{12}}$

206) $\lim\limits_{x\to\infty}x^{2}.\left[\left(\dfrac{x+1}{x-1}\right)^{x}-e^{2}\right]=\dfrac{2}{3}e^{2}$

207) $\lim\limits_{x\to 0^{+}}\dfrac{xe^{\frac{1}{x}}}{1+e^{\frac{1}{x}}}=0$

208) $\lim\limits_{x\to 0}\dfrac{\left(e^{2x}+1\right)-\left(x+1\right)\left(e^{x}+e^{-x}\right)}{x\left(e^{x}-1\right)}=1$

209) $\lim\limits_{x\to 0}\dfrac{e^{\tan x}-e^{x}}{\tan x-x}=1$

210) $\lim\limits_{x\to\infty}\left[\dfrac{\left(x+1\right)^{x}}{x^{x}e}\right]^{x}=\dfrac{1}{\sqrt{e}}$

211) $\lim\limits_{x\to\infty}\left[\dfrac{e}{\left(1+\dfrac{1}{x}\right)^{x}}\right]^{x}=1$

212) $\lim\limits_{x\to 0}\dfrac{e^{x}+\ln\left(\dfrac{1-x}{e}\right)}{\tan x-x}=-\dfrac{1}{2}$

213) $\lim\limits_{x\to\infty}x\ln\left[\dfrac{\sin\left(a+\dfrac{1}{x}\right)}{\sin a}\right],\left(0<a<\dfrac{\pi}{2}\right)\;=\;\cot a$

214) $\lim\limits_{x\to\pi}\dfrac{\sin^{-1}\left(1+\cos x\right).\sec\left(\dfrac{x}{2}\right)}{x-\pi}=-1$

215) $\lim\limits_{x\to 0}\left[\sin^{2}\left(\dfrac{\pi}{2-px}\right)\right]^{\sec^{2}\left(\frac{\pi}{2-px}\right)}=\dfrac{1}{e}$

216) $\lim\limits_{x\to\frac{\pi}{2}}\left(x\tan x-\dfrac{\pi}{2}\sec x\right)=-1$

217) $\lim\limits_{x\to 0}x^{2}\cos\left(\pi\sec^{2}x\right).\csc\left(\pi\sec^{2}x\right)=\dfrac{1}{\pi}$

218) $\lim\limits_{x\to\infty}\left(\dfrac{1}{e}-\dfrac{x}{1+x}\right)^{x}$

219) $\lim\limits_{x\to\infty}\left[\left(\dfrac{e}{1-e}\right)\left(\dfrac{1}{e}-\dfrac{x}{1+x}\right)\right]^{x}=e^{\frac{e}{1-e}}$

220) $\lim\limits_{x\to 0}\dfrac{e^{\frac{1}{x}}-1}{e^{\frac{1}{x}}+1}$

221) $\lim\limits_{x\to 0}\dfrac{e^{\frac{1}{x}}-e^{-\frac{1}{x}}}{e^{\frac{1}{x}}+e^{-\frac{1}{x}}}=1$

222) $\lim\limits_{x\to 0^-}\dfrac{e^{\frac{1}{x}}}{x}$

223) $\lim\limits_{x\to\infty}\dfrac{x\ln\left(1+\dfrac{\ln x}{x}\right)}{\ln x}=1$

224) $\lim\limits_{h\to 0}\dfrac{\left[\sin\left(x+h\right)\right]^{x+h}-\left(\sin x\right)^{\sin x}}{h}=\left(\sin x\right)^{x}.\left[x\cot x+\ln\left(\sin x\right)\right]$

225) $\lim\limits_{x\to 1}\dfrac{1+\sin\left(\dfrac{3\pi x}{1+x^{2}}\right)}{1+\cos\left(\pi x\right)}=0$

226) $\lim\limits_{x\to 0}\dfrac{\sin\left(x^{4}\right)-x^{4}\cos\left(x^{4}\right)}{x^{4}\left(e^{2x^{4}}-1-2x^{4}\right)}=\dfrac{1}{6}$

227) $\lim\limits_{x\to 0}\dfrac{\cos\left(\tan x\right)-\cos x}{x^{4}}=-\dfrac{1}{3}$

228) $\lim\limits_{x\to 0}\dfrac{\log\limits_{\sec\left(\frac{x}{2}\right)}\left(\cos x\right)}{\log\limits_{\sec x}\left[\cos\left(\dfrac{x}{2}\right)\right]}=16$

229) $\lim\limits_{x\to\infty}\left[x-\ln\left(\dfrac{e^{x}+e^{-x}}{2}\right)\right]=\ln 2$

230) $\lim\limits_{x\to -1}\dfrac{\log\left(x^2\right)-\log\left(\dfrac{1}{x^4}\right)+\log 3}{\log\left(\dfrac{x^3}{-3}\right)}=-1$

231) $\lim\limits_{x\to a}\dfrac{1}{\left(a^2-x^2\right)^2}\cdot\left[\dfrac{a^2+x^2}{ax}-2\sin\left(\dfrac{a\pi}{2}\right)\sin\left(\dfrac{\pi x}{2}\right)\right]$, a ជាចំនួនគត់សេស $=4+\dfrac{\pi^2}{16a^2}$

232) $\lim\limits_{x\to 0}\dfrac{e^x-1-x-\dfrac{x^2}{2!}-\dfrac{x^3}{3!}-\cdots\cdots-\dfrac{x^n}{n!}}{x^{n+1}}=\dfrac{1}{\left(n+1\right)!}$

233) $\lim\limits_{x\to 0}\dfrac{e^{\frac{1}{x}}-\left(1+nx+\dfrac{n^2}{2}x^2\right)}{x^3}$, $\left(n>0\right)=\dfrac{n^3}{6}$

234) $\lim\limits_{x\to 1}\dfrac{nx^{n+1}-nx^n}{\left(e^x-e^2\right)\sin\left(\pi x\right)}=\dfrac{n}{\left(e^2-e\right)\pi}$

235) $\lim\limits_{x\to 0^+}\left[\dfrac{e^{x\ln\left(2^x-1\right)}-\left(2^x-1\right)^x\sin x}{e^{x\ln x}}\right]^{\frac{1}{x}}=\dfrac{\ln 2}{e}$

236) $\lim\limits_{x\to 0}\dfrac{e^x\sin x-x-x^2}{x^2+x-\ln\left(1-x\right)}=0$

237) $\lim\limits_{x\to e}\left(\ln x\right)^{\frac{1}{\ln\left(\frac{e}{x}\right)}}=\dfrac{1}{e}$

238) $\lim\limits_{x\to 0}\left(\dfrac{\dfrac{1}{1+\sin^2 x}}{2\sec^2\left(\ln^2\left(1+x\right)\right)}\right).\left(\dfrac{\sin 2x}{\ln\left(1+x\right).\left(\dfrac{1}{1+x}\right)}\right)=1$

239) $\lim\limits_{x\to 0}\left(\dfrac{\ln\left(\left(1+x\right)^{1+x}\right)}{x^2}-\dfrac{1}{x}\right)=\dfrac{1}{2}$

240) $\lim\limits_{x\to\infty}\pi.\left[\,x\ln\left(1+\pi x\right)-x\ln\left(\pi x\right)\,\right]=1$

241) $\lim\limits_{n\to\infty}\dfrac{a^n+b^n}{a^n-b^n}\,,a>b>1=1$

242) $\lim\limits_{n\to\infty}\dfrac{n^{\left(n+\frac{1}{\ln n}\right)}}{\left(n+\dfrac{1}{\ln n}\right)^n}=e$

243) $\lim\limits_{n\to\infty}\left[\,\left(2009^{2010}\right)^n+\left(2010^{2009}\right)^n\,\right]^{\frac{1}{n}}=2009^{2010}$

244) $\lim\limits_{n\to\infty}\left(2005^n+2007^n+2008^n+2009^n\right)^{\frac{1}{n}}=2009$

245) $\lim\limits_{x\to\infty}\dfrac{e^x.\left[\left(2^{x^n}\right)^{\frac{1}{e^x}}-\left(3^{x^n}\right)^{\frac{1}{e^x}}\right]}{x^n}\,,\left(n\in\mathbb{N}\right)=\ln\left(\dfrac{2}{3}\right)$

246) $\lim\limits_{x\to\infty}\dfrac{\left(2^{x^n}\right)^{\frac{1}{e^x}}-\left(3^{x^n}\right)^{\frac{1}{e^x}}}{x^n}\,,\left(n\in\mathbb{N}\right)=0$

247) $\lim\limits_{n\to\infty}\left(1-x+xe^{\frac{1}{n}}\right)^n = e^x$

248) $\lim\limits_{x\to\infty} x\ln\left[e\left(1+\frac{1}{x}\right)^{1-x}\right] = \frac{3}{2}$

249) $\lim\limits_{n\to\infty}\left(\frac{C_{3n}^n}{C_{2n}^n}\right)^{\frac{1}{n}} = 1$

250) $\lim\limits_{n\to\infty}\frac{n}{\left(n!\right)^{\frac{1}{n}}} = e$

251) $\lim\limits_{n\to\infty}\left[\left(n+1\right)^{n+1}.n^{-n-1}-\left(n+1\right).n^{-1}\right] = e-1$

252) $\lim\limits_{n\to\infty}\frac{n^n.\left(n+1\right)!}{n!.\left(n+1\right)^{n+1}} = 1$

253) $\lim\limits_{n\to\infty}\frac{n!.3^{n+1}}{3^n.\left(n+1\right)!} = 0$

254) $\lim\limits_{n\to\infty}\left[\frac{1.n+2\left(n-1\right)+3\left(n-2\right)+\cdots+n.1}{1^3+2^3+3^3+\cdots+n^3}+1\right]^n = 1$

255) $\lim\limits_{n\to\infty}\frac{P\left(n,n\right)}{P\left(n+1,n+1\right)-P\left(n,n\right)} = 0$

256) $\lim\limits_{n\to\infty}\left(\frac{\sqrt{n^2+n}-1}{n}\right)^{2\sqrt{n^2+n}-1} = \frac{1}{e}$

257) $\lim\limits_{n\to\infty}\dfrac{n^{\alpha}.\sin^{2}\left(n!\right)}{n+1}\ ,\ \left(0<\alpha<1\right)\ =0$

258) $\lim\limits_{n\to\infty}\left(2n-1\right)\left(2n\right)n^{2}.\left(2n+1\right)^{-2}\left(2n+2\right)^{-2}=\dfrac{1}{4}$

259) $\lim\limits_{n\to\infty}\dfrac{e^{2n}.\left(n!\right)^{2}}{2.n^{2n+1}}=1$

260) $\lim\limits_{n\to\infty}\dfrac{\left[\ 1+\dfrac{1}{n\left(n+100\right)}\ \right]^{n^{3}}}{\left[\ 1+\dfrac{1}{n\left(n+200\right)}\ \right]^{n^{3}}}=e^{100}$

261) $\lim\limits_{x\to1}\left[\ \dfrac{x^{n}-1}{n\left(x-1\right)}\ \right]^{\frac{1}{x-1}}=e^{\ \frac{n-1}{2}}$

262) $\lim\limits_{n\to\infty}n\sin\left(2\pi\sqrt{1+n^{2}}\right)\ ,\ n\in\mathbb{N}\ =\pi$

263) $\lim\limits_{n\to\infty}\dfrac{e^{n}}{\left(1+\dfrac{1}{n}\right)^{n^{2}}}=e^{\frac{1}{2}}$

264) $\lim\limits_{m\to\infty}\lim\limits_{n\to\infty}\cos^{2m}\left(n!.\pi x\right)\ ,\ x$ ជាចំនួនអសនិទាន $=0$

265) $\lim\limits_{n\to\infty}\cos^{2}\left[\ \pi\left(\sqrt[3]{n^{3}+n^{2}+2n}-n\right)\ \right]\ ,\ \left(n\in\mathbb{Z}\right)=\dfrac{1}{4}$

266) $\lim\limits_{n\to\infty}\cos\left(\pi\sqrt{n^{2}+n}\ \right)\ ,\ \left(n\in\mathbb{Z}\right)=0$

267) $\lim\limits_{n\to\infty}\left(\tan\left(\left(\frac{\pi-4}{4}\right)+\left(1+\frac{1}{n}\right)^{\alpha}\right)\right)^{n}$, $\alpha\in\mathbb{Q}=e^{2\alpha}$

268) $\lim\limits_{n\to\infty}\left[\left(\frac{n}{n+1}\right)^{\alpha}+\sin\left(\frac{1}{n}\right)\right]^{n}$, $\alpha\in\mathbb{Q}=e^{1-\alpha}$

269) $\lim\limits_{x\to\infty}\left[\left(x+5\right)\tan^{-1}\left(x+5\right)-\left(x+1\right)\tan^{-1}\left(x+1\right)\right]=2\pi$

270) $\lim\limits_{x\to\cot^{-1}(-1)}\frac{\tan^{3}x-2\tan x-1}{\tan^{5}x-2\tan x-1}=\frac{1}{3}$

271) $\lim\limits_{x\to\alpha}\left(\tan x.\cot\alpha\right)^{\frac{1}{x-\alpha}}=2\csc\left(2\alpha\right)$

272) $\lim\limits_{x\to0}\frac{\sin\left(\alpha+x\right)-\sin\left(\alpha-x\right)}{\cos\left(\alpha+x\right)-\cos\left(\alpha-x\right)}=-\cot\alpha$

273) $\lim\limits_{x\to0}\frac{\sin\left[\left(\alpha+\beta\right)x\right]+\sin\left[\left(\alpha-\beta\right)x\right]+\sin\left(2\alpha x\right)}{\cos^{2}\left(\beta x\right)-\cos^{2}\left(\alpha x\right)}$

274) $\lim\limits_{x\to4}\frac{\left(\cos\alpha\right)^{x}-\left(\sin\alpha\right)^{x}-\cos\left(2\alpha\right)}{x-4}=\cos^{4}\alpha.\ln\left(\cos\alpha\right)-\sin^{4}\alpha.\ln\left(\sin\alpha\right),\alpha\in\left]0,\frac{\pi}{2}\right[$

275) $\lim\limits_{x\to2}\frac{\left(\cos\alpha\right)^{x}+\left(\sin\alpha\right)^{x}-1}{x-2}=\cos^{2}\alpha.\ln\left(\cos\alpha\right)+\sin^{2}\alpha.\ln\left(\sin\alpha\right)$

276) $\lim\limits_{x\to1}\left(1+\frac{1+x}{2!}+\frac{1+x+x^{2}}{3!}+\cdots\cdots\right)=e$

277) $\lim\limits_{x\to\infty}\left(\dfrac{2^{\frac{1}{x}}+27^{\frac{1}{x}}+8^{\frac{1}{x}}}{3}\right)^{x}=\left(2^{4}.3^{3}\right)^{\frac{1}{3}}$

278) $\lim\limits_{x\to\frac{\pi}{2}}\dfrac{1-\left(\sin x\right)^{\sin x}}{\cos^{2}x}=\dfrac{1}{2}$

279) $\lim\limits_{x\to 0}\dfrac{x\tan 2x-2x\tan x}{\left(1-\cos 2x\right)^{2}}=-\dfrac{1}{2}$

280) $\lim\limits_{x\to 0}\dfrac{2\ln\left(1+x\right)-\ln\left(1+2x\right)}{x^{2}}=1$

281) $\lim\limits_{x\to 0}\dfrac{\ln\left(1+x\right)-x}{x\left[\left(1+x\right)^{\frac{1}{x}}-e\right]}=\dfrac{1}{e}$

282) $\lim\limits_{x\to\infty}x\left[\dfrac{1}{e}-\left(\dfrac{x}{x+1}\right)^{x}\right]=-\dfrac{1}{2e}$

283) $\lim\limits_{x\to 0^{-}}\dfrac{\cos^{-1}\left(\cos x\right)}{\sin^{-1}\left(\sin x\right)}=-1$

284) $\lim\limits_{x\to\pi}\dfrac{1-\sin\left(\dfrac{x}{2}\right)}{\cos\left(\dfrac{x}{2}\right)\cdot\left[\cos\left(\dfrac{x}{4}\right)-\sin\left(\dfrac{x}{4}\right)\right]}=\dfrac{1}{\sqrt{2}}$

285) $\lim\limits_{x\to\frac{\pi}{4}}\dfrac{\sin^{3}x-\cos^{3}x}{x-\dfrac{\pi}{4}}=\dfrac{3}{\sqrt{2}}$

286) $\lim\limits_{x\to\sqrt{\pi}} \dfrac{\sin\left(x^2\right)-\cos\left(\dfrac{3x^2}{2}\right)}{\cos\left(\dfrac{x^2}{2}\right)-\sin\left(2x^2\right)\cos^2\left(x^2\right)} = 1$

287) $\lim\limits_{x\to\frac{\pi}{4}} \dfrac{2\sqrt{2}-\left(\cos x+\sin x\right)^3}{1-\sin 2x} = \dfrac{3}{\sqrt{2}}$

288) $\lim\limits_{x\to\frac{\pi}{4}} \dfrac{4\sqrt{2}-\left(\cos x+\sin x\right)^5}{1-\sin 2x} = 5\sqrt{2}$

289) $\lim\limits_{x\to\frac{\pi}{2}} \dfrac{\sin\left(\cos x\right).\cos x}{\sin x-\csc x} = -1$

290) $\lim\limits_{x\to\frac{3\pi}{4}} \dfrac{4\sin^2 x.\cos x-\cos x+\sin x}{\sin x+\cos x} = -1$

291) $\lim\limits_{x\to 0} \dfrac{e^{-\frac{x^2}{2}}-\cos x}{x^3\sin x} = \dfrac{1}{12}$

292) $\lim\limits_{x\to 0} \dfrac{\sin\left(\sin x\right)-\tan\left(\sin x\right)}{\sin^3\left(\sin x\right)} = \dfrac{1}{2}$

293) $\lim\limits_{x\to 0} \dfrac{\sin x+\ln\left(\sqrt{1+\sin^2 x}-\sin x\right)}{\sin^3 x} = \dfrac{1}{6}$

294) $\lim\limits_{x\to 0} \dfrac{e^{\sin x}-\left(1+\sin x\right)}{\tan^2\left(\sin x\right)} = \dfrac{1}{2}$

295) $\lim\limits_{x\to 0}\dfrac{1-\left(\cos 2x\right)^{3}\left(\cos 5x\right)^{5}\left(\cos 7x\right)^{7}\left(\sec 4x\right)^{9}\left(\sec 9x\right)^{11}}{x^{2}}=-30$

296) $\lim\limits_{x\to 0}\dfrac{1}{x^{2}}\cdot\sqrt{\dfrac{1-\cos 2x}{1+\cos 2x}}\cdot\sqrt{\dfrac{1-\cos x}{1+\cos x}}=\dfrac{1}{2}$

297) $\lim\limits_{x\to -\infty}\dfrac{x^{5}\tan\left(\dfrac{1}{\pi x^{2}}\right)+3\left|x\right|^{2}+7}{\left|x\right|^{3}+7\left|x\right|+8}=-\dfrac{1}{\pi}$

298) $\lim\limits_{x\to 0}\left(\dfrac{1}{x^{5}}\int_{0}^{5}e^{-t^{2}}dt-\dfrac{1}{x^{4}}+\dfrac{1}{3x^{2}}\right)=\dfrac{1}{10}$

299) $\lim\limits_{n\to\infty}\dfrac{\left[\,x^{2}+2x+3+\sin\left(\pi x\right)\,\right]^{n}-1}{\left[\,x^{2}+2x+3+\sin\left(\pi x\right)\,\right]^{n}+1}=1$

300) $\lim\limits_{x\to 0^{+}}\left[\dfrac{1-\cos\left(\sin^{2}x\right)}{x^{2}}\right]^{\frac{\ln\left(1-2x^{2}\right)}{\sin^{2}x}}=0$

301) $\lim\limits_{n\to\infty}\left(-1\right)^{n-1}\sin\left(\pi\sqrt{n^{2}+\dfrac{n}{2}+1}\right),\left(n\in\mathbb{N}\right)=-\dfrac{1}{\sqrt{2}}$

302) $\lim\limits_{n\to\infty}\sin^{n}\left(\dfrac{2\pi n}{3n+1}\right),\left(n\in\mathbb{N}\right)=0$

303) $\lim\limits_{n\to\infty}\left[\dfrac{1+\tan\left(\dfrac{\pi}{2n}\right)}{1+\sin\left(\dfrac{\pi}{3n}\right)}\right]^{n}=e^{\frac{\pi}{6}}$

304) $\lim\limits_{n\to\infty}\left(ea^2.e^3a^4.e^4a^5\times\cdots\times e^{n-1}a^n\right)^{\frac{1}{n^2+1}}=e^{\frac{1+\ln a}{4}}$

305) $\lim\limits_{n\to\infty}\left[\frac{(kn)!}{n^{kn}}\right]^{\frac{1}{n}}=\frac{k}{e}$

306) $\lim\limits_{n\to\infty}\left[\log_{n-1}(n).\log_n(n+1).\log_{n+1}(n+2)\times\cdots\times\log_{n^k-1}\left(n^k\right)\right]=k$

307) $\lim\limits_{n\to\infty}n\sum\limits_{k=0}^{n-1}\int_{\frac{k}{n}}^{\frac{k+1}{n}}\sqrt{\left(x-\frac{k}{n}\right)\left(\frac{k+1}{n}-x\right)}dx=\frac{\pi}{8}$

308) $\lim\limits_{n\to\infty}\left[1+\sum\limits_{k=1}^{n}\left(\frac{3}{C_n^k}\right)\right]^n=e^3$

309) $\lim\limits_{n\to\infty}\sum\limits_{k=2}^{n}\cos^{-1}\left[\frac{1+\sqrt{(k-1)k(k+1)(k+2)}}{k(k+1)}\right]=\frac{\pi}{6}$

310) $\lim\limits_{n\to\infty}\frac{\sum\limits_{k=1}^{n}k(k+1)(k+2)\times\cdots\times(k+m-1)}{n(n+1)(n+2)\times\cdots\times(n+m)}=\frac{1}{m+1}$

311) $\lim\limits_{n\to\infty}\sum\limits_{k=1}^{n}\frac{1}{k(k+1)(k+2)\times\cdots\times(k+m+1)}=\frac{1}{m\times m!}$

312) $\lim\limits_{n\to\infty}\frac{\sum\limits_{k=1}^{n}k(k+1)(k+2)\times\cdots\times(k+m-1)}{\sum\limits_{k=1}^{n}k^m}=1$

313) $\lim\limits_{n\to\infty}\dfrac{\left(n+1\right)\ln\left(n!\right)-2\ln\left(2!\times 3!\times\cdots\times n!\right)}{n^2+n}=\dfrac{1}{2}$

314) $\lim\limits_{n\to\infty}\sqrt[n]{\dfrac{C_n^0+C_n^1+C_n^2+\cdots+C_n^n}{n+1}}$

315) $\lim\limits_{n\to\infty}\sqrt[n]{\sqrt[n+1]{C_n^0\times C_n^1\times C_n^2\times\cdots\times C_n^n}}$

316) $\lim\limits_{x\to 0}\left(\ln\dfrac{1}{x}\right)^{\ln\left(1-x\right)}$

317) $\lim\limits_{x\to-\infty}\left(e^x+e^{e^x}\right)^{e^{-x}}=e^2$

318) $\lim\limits_{x\to-\infty}\dfrac{e^{e^x}+e^{-e^{-x}}-1}{e^{e^{e^x}}-\left(1+\dfrac{1}{x}\right)^x}$

319) $\lim\limits_{n\to+\infty}\left(1+\dfrac{1}{2^2}+\dfrac{1}{3^2}+\dfrac{1}{4^2}+\cdots+\dfrac{1}{n^2}\right)=\dfrac{\pi^2}{6}$

320) $\lim\limits_{x\to 0}\dfrac{\sqrt{\cos 2x-2x}-\sqrt[4]{\sqrt{1+2x^2}-4x}}{x^2}=-\dfrac{1}{4}$

321) $\lim\limits_{x\to 0}\dfrac{\sqrt{8x^3+x^2+6x+9}-\sqrt[3]{9x^2+27x+27}}{x^3}=\dfrac{37}{27}$

322) $\lim\limits_{x\to 0}\dfrac{\sqrt{\dfrac{\cos 2x+\sqrt[3]{1+3x}}{2}}-\sqrt[3]{\dfrac{\cos 3x+3\cos x-\ln\left[\left(1+x\right)^4\right]}{4}}}{x}=\dfrac{4}{3}$

323) $\lim\limits_{x\to 0}\dfrac{\ln\left[\left(1+\tan x\right)^{x^3\cot x}\right]}{\sqrt{\left(1+2x\right)\left(1+x^2\right)}-\sqrt[3]{\left(1+3x\right)\left(1+3x^2\right)}}=-\dfrac{3}{5}$

324) $\lim\limits_{n\to\infty}\left[\left(\dfrac{1}{2}\tan\dfrac{a}{2}\right)^2+\left(\dfrac{1}{2^2}\tan\dfrac{a}{2^2}\right)^2+\cdots+\left(\dfrac{1}{2^n}\tan\dfrac{a}{2^n}\right)^2\right],\ a\neq k\pi$

325) $\lim\limits_{x\to 0}\dfrac{\sqrt{3+2x+x^2-2\cos 2x}-\sqrt[4]{2+4x+x^3-\sqrt{1+2x^2}}}{x^2}$

326) $\lim\limits_{x\to 0}\dfrac{\sqrt{\dfrac{\sin\left[2\left(\dfrac{\pi}{4}-x\right)\right]+\sqrt[3]{1+9x}}{2}}-\sqrt[3]{\dfrac{\cos 3x+3\sqrt{2}\cos\left(\dfrac{\pi}{4}-x\right)}{4}}}{\sin 3x}$

327) $\lim\limits_{n\to\infty}\sum\limits_{k=1}^{n}\sum\limits_{p=1}^{n}\dfrac{k^2+kp+p}{k\left(k+1\right).\left(k+p\right)!}=e$

328) $\lim\limits_{n\to\infty}\dfrac{n}{a^{n+1}}\left(a+\dfrac{a^2}{2}+\dfrac{a^3}{3}+\cdots+\dfrac{a^n}{n}\right),\left(a>1\right)=\dfrac{1}{a-1}$

329) $\lim\limits_{n\to\infty}\dfrac{1}{n}\left(e^{a^2}\cos na-e^{b^2}\cos nb\right)=0$

330) $\lim\limits_{n\to\infty}\sqrt[n]{2013\sin^2\left(\dfrac{n^{2014}}{\ln n}\right)+\cos^2\left(\dfrac{n^{2014}}{\ln n}\right)}=1$

331) $\lim\limits_{n\to\infty}\left[\cos\left(\pi n.\sqrt[3]{n^3+3n^2+n+1}\right)+\sin\left(\pi n.\sqrt[3]{n^3+3n^2+n+1}\right)\right]=-\dfrac{1+\sqrt{3}}{2}$

332) $\lim\limits_{x\to 0}\left(x^x+x^{2x}+x^{3x}+\cdots+x^{nx}\right)$

333) $\lim\limits_{n\to+\infty}\dfrac{\cos^2 a+\cos^2 2a+\cos^2 3a+\cdots+\cos^2\left(na\right)}{na+1}$

334) $\lim\limits_{n\to+\infty}\left(\cos^2 a.\sqrt[n]{\cos a}+\sin^2 a.\sqrt[n]{\sin a}\right)^n,\left(\ a\in\right]0,\dfrac{\pi}{2}[\ \right)=\left(\cos a\right)^{\cos^2 a}.\left(\sin a\right)^{\sin^2 a}$

335) $\lim\limits_{n\to+\infty}\left(\sqrt{2-\sqrt{2}}.\sqrt{2-\sqrt{2+\sqrt{2}}}\times\cdots\times\underbrace{\sqrt{2-\sqrt{2+\sqrt{2+\cdots+\sqrt{2}}}}}_{n}\right)=0$

336) $\lim\limits_{n\to+\infty}\sqrt{1+2\sqrt{1+3\sqrt{1+\cdots+\sqrt{1+\left(n-1\right)\sqrt{1+n}}}}}=3$

337) $\lim\limits_{x\to 2^{2018}}\dfrac{x^2-4^{2018}}{x-2^{2018}}=2^{2019}$

338) $\lim\limits_{x\to a}\dfrac{a\sin x-x\sin a}{ax^2-xa^2}=\dfrac{a\cos a-\sin a}{a^2}$

339) $\lim\limits_{x\to\infty}\left[\dfrac{ax-b\cos\left(\dfrac{1}{x}\right)}{ax-b\sin\left(\dfrac{1}{x}\right)}\right]^x,\ a\neq 0$

340) $\lim\limits_{x\to 1}\dfrac{\sin\left(1-\dfrac{1}{x}\right).\cos\left(1-\dfrac{1}{x}\right)}{x-1}=1$

341) $\lim\limits_{h\to 0}\dfrac{\sin\left(\dfrac{\pi}{3}+4h\right)-4\sin\left(\dfrac{\pi}{3}+3h\right)+6\sin\left(\dfrac{\pi}{3}+2h\right)-4\sin\left(\dfrac{\pi}{3}+h\right)+\sin\left(\dfrac{\pi}{3}\right)}{h^4}=\dfrac{\sqrt{3}}{2}$

342) $\lim\limits_{x\to 0}\dfrac{1}{x}\left[\ \ln\left(\sqrt{1+x}\right)-\ln\left(\sqrt{1-x}\right)\ \right]=1$

343) $\lim\limits_{x\to 0}\dfrac{\sqrt[3]{1-\arctan\left(3x\right)}-\sqrt[3]{1-\arcsin\left(3x\right)}}{\sqrt{1-\arcsin\left(2x\right)}-\sqrt{1+\arctan\left(2x\right)}}=-1$

344) $\lim\limits_{h\to 0}\dfrac{a^{x+h}+a^{x-h}-2a^{x}}{h^{2}}=a^{x}\ln^{3}a$

345) $\lim\limits_{x\to 0}\dfrac{\cos\left(xe^{x}\right)-\cos\left(xe^{-x}\right)}{x^{3}}=-2$

346) $\lim\limits_{x\to+\infty}\left[\ x\left(1+\dfrac{1}{x}\right)\left(1+\dfrac{1}{x}\right)^{2}\times\cdots\times\left(1+\dfrac{1}{x}\right)^{n}\ \right]^{-2x}=0$

347) $\lim\limits_{x\to+\infty}\left[\ \left(1+\dfrac{1}{x}\right)\left(1+\dfrac{1}{x}\right)^{2}\times\cdots\times\left(1+\dfrac{1}{x}\right)^{n}\ \right]^{x}=e^{\frac{n\left(n+1\right)}{2}}$

348) $\lim\limits_{x\to a}\left(x^{2}-a^{2}+1\right)^{\frac{5x+1}{5x^{2}+\left(1-5a\right)x-a}}=e^{2a}$

349) $\lim\limits_{x\to 0}\left(1-e^{x}\right)\left(1-e^{x^{2}}\right)\times\cdots\times\left(1-e^{x^{n}}\right)\times\dfrac{x-1}{x^{\frac{n\left(n+1\right)}{2}}}=\left(-1\right)^{n+1}$

350) $\lim\limits_{x\to 1^{+}}\left(\ln x\right)^{\alpha}.\ln\left(\ln x\right)$

351) $\lim\limits_{x\to 0}\dfrac{e^{x}-\sum\limits_{r=0}^{n}x^{r}r!}{x^{n}}\ ,\ \left(n\in\mathbb{N}^{*}\right)$

352) $\lim\limits_{x\to 0}\dfrac{\sin x-\sum\limits_{r=0}^{n}\left(-1\right)^{r}\dfrac{x^{2r+1}}{\left(2r+1\right)!}}{x^{2r+1}}\ ,\left(n\in\mathbb{N}\right)$

353) $\lim\limits_{x\to 0}\dfrac{e^{x}-\sum\limits_{r=0}^{n}\dfrac{x^{r}}{r!}}{x^{n}}=0$

354) $\lim\limits_{x\to 1}\dfrac{\ln x-\sum\limits_{r=1}^{n}\left(-1\right)^{r-1}.r.\left(x-1\right)^{r}}{\left(x-1\right)^{n}}\ ,\left(n\geq 1\right)=0$

355) $\lim\limits_{n\to\infty}n\left(\sqrt[n]{a^{n}+b}+\sqrt[n]{a+b^{n}}-a-b\right)\ ,\ a,b>1$

356) $\lim\limits_{x\to 0}\dfrac{1}{ax}\cdot\ln\left(\sqrt[3]{\dfrac{1+ax}{1-ax}}\right)=\dfrac{2}{3}$

357) $\lim\limits_{x\to\infty}\left[\ 3-2\left(\dfrac{ax+1}{ax}\right)\ \right]^{\tan\left[\ \frac{\pi}{2}\left(\frac{ax+1}{ax}\right)\ \right]}=e^{\frac{4}{\pi}}$

358) $\lim\limits_{x\to 0}\dfrac{\left(2x\sin\dfrac{1}{x}-\cos\dfrac{1}{x}\right)\sin x-x^{2}\cos x.\sin\dfrac{1}{x}}{\sin^{2}x}$

359) $\lim\limits_{x\to 0}\dfrac{x+\sqrt{\left|x\right|}}{x-\sqrt{\left|x\right|}}$

360) $\lim\limits_{x\to 0}\dfrac{\sqrt[3]{\left|x\right|}+\sqrt{\left|x\right|}}{\sqrt[3]{\left|x\right|}-\sqrt{\left|x\right|}}$

361) $\lim\limits_{x\to\infty}\left(e^{e^{e^{\left(x+e^{-\left(a+x+e^{x}+e^{e^{x}}\right)}\right)}}}-e^{e^{e^{x}}}\right)$

362) $\lim\limits_{x\to+\infty}\left[\left(x+a\right)^{1+\frac{1}{x}}-x^{1+\frac{1}{x+a}}\right]$

363) $\lim\limits_{x\to 0}\dfrac{1}{x\sqrt{x}}\left[\sqrt{a}\arctan\left(\sqrt{\dfrac{x}{a}}\right)-\sqrt{b}\arctan\left(\sqrt{\dfrac{x}{b}}\right)\right]$

364) $\lim\limits_{n\to\infty}\dfrac{\sqrt[n]{\prod\limits_{i=0}^{n-1}\left(a+ib\right)}}{\sum\limits_{i=0}^{n-1}\left(a+ib\right)}$

365) $\lim\limits_{x\to a}\dfrac{x^{4}-ax^{3}-a^{2}x^{2}+a^{3}x}{x^{5}-ax^{4}-a^{4}x+a^{5}}$

366) $\lim\limits_{x\to -a}\dfrac{x^{3}+\left(2a+b\right)x^{2}+\left(a^{2}+2ab\right)x+a^{2}b}{x^{3}+\left(a+2b\right)x^{2}+\left(b^{2}+2ab\right)x+ab^{2}}=0$

367) $\lim\limits_{x\to -\frac{a}{b}y}\dfrac{ab\left(x^{2}+y^{2}\right)+xy\left(a^{2}+b^{2}\right)}{ab\left(x^{2}-y^{2}\right)+xy\left(a^{2}-b^{2}\right)}$

368) $\lim\limits_{x\to 0}\dfrac{1}{x^{k+1}}\int_{0}^{x}\left(x^{k}+x^{k-1}y+x^{k-2}y^{2}+\cdots+y^{k}\right).f\left(y\right)dy$

369) $\lim\limits_{x\to a}\dfrac{\int_0^x f\left(t\right)dt-\dfrac{x-a}{6}\left[\ f\left(a\right)+4\left(\dfrac{a+x}{2}\right)+f\left(x\right)\ \right]}{\left(x-a\right)^5}$

370) $\lim\limits_{a\to b}\dfrac{\left(-1\right)^{\frac{a}{b}}\cdot\dfrac{b}{a}-\left(-1\right)^{\frac{b}{a}}\cdot\dfrac{a}{b}}{a-b}$

371) $\lim\limits_{x\to 1}\dfrac{x^p.\left(a+x^q\right)^r-\left(ax^q+1\right)^r}{\left(b+x^p\right)^m-\left(b+1\right)^m}$

372) $\lim\limits_{x\to a}\dfrac{\left(\dfrac{x}{a}\right)^m-\left(\dfrac{a}{x}\right)^m}{\left[\ b+\left(\dfrac{x}{a}\right)^p\ \right]^q-\left[\ b+\left(\dfrac{a}{x}\right)^p\ \right]^q}$

373) $\lim\limits_{a\to b}\dfrac{\left[\ 2\left(\dfrac{a}{b}\right)+\left(\dfrac{b}{a}\right)^3\ \right]^4-\left[\ 2\left(\dfrac{b}{a}\right)+\left(\dfrac{a}{b}\right)^3\ \right]^4}{\left[\ 3\left(\dfrac{a}{b}\right)^2+\left(\dfrac{b}{a}\right)^3\ \right]^5-\left[\ 3\left(\dfrac{b}{a}\right)^4+\left(\dfrac{a}{b}\right)^5\ \right]^5}$

374) $\lim\limits_{m\to n}\dfrac{m^2-3mn+2n^2}{\dfrac{\left(m+n\right)^2}{2}-mn-n^2}$

375) $\lim\limits_{x\to b-c}\dfrac{x\left(x+c\right)+b\left(c-b\right)}{c\left(x+c\right)+b\left(x-b\right)}=\dfrac{2b-c}{b+c}$

376) $\lim\limits_{x\to a+b}\dfrac{a\left(x-a\right)-b\left(x-b\right)}{\dfrac{a}{b}\left(1-\dfrac{a}{x}\right)+\dfrac{b}{a}\left(1-\dfrac{b}{x}\right)-1}=\dfrac{ab\left(a+b\right)\left(a-b\right)}{a^{2}-ab+b^{2}}$

377) $\lim\limits_{x\to y}\dfrac{x^{3}y-y^{3}x}{x^{2}y-xy^{2}}=2x$

378) $\lim\limits_{x\to 2}\dfrac{\tan\left(2\pi x\right)+\cos\left(\dfrac{\pi}{2}x\right)+\tan\left(\dfrac{\pi}{8}x\right)}{x^{2}+4x-12}$

379) $\lim\limits_{n\to\infty}\dfrac{\sqrt[n]{1+\sin a}+\sqrt[n]{1-\sin a}-2}{n\left[\sqrt[n+1]{1-\sin a}+\sqrt[n+1]{1+\sin a}-2\right]}$

380) $\lim\limits_{x\to-\infty}\dfrac{x^{3}\cos\left(\dfrac{\pi x+1}{x}\right)-\sin^{2}\left(\dfrac{\pi x+1}{x}\right)+1}{2x+1}$

381) $\lim\limits_{x\to 3}\dfrac{2\sqrt{2x^{2}-2}-3.\sqrt[3]{x^{2}-1}-2}{\arcsin x-\arcsin 3}$

382) $\lim\limits_{x\to 0}\dfrac{\ln\left(x^{2}+3x+4\right)-\ln\left(x^{2}-2x+5\right)}{x^{2}}$

383) $\lim\limits_{x\to 1}\dfrac{\left(1-x\right)^{n-1}}{\left(1-\sqrt{x}\right)\left(1-\sqrt[3]{x}\right)\times\cdots\times\left(1-\sqrt[n]{x}\right)}=n!$

384) $\lim\limits_{n\to\infty}\sqrt[n^{2}]{C_{n+1}^{1}C_{n+2}^{2}C_{n+3}^{3}\times\cdots\times C_{2n}^{n}}$

385) $\lim\limits_{x\to 2}\dfrac{\sqrt[6]{6x^{4}-12x^{3}-x+2}}{\sqrt[6]{x+2}}\times\dfrac{\sqrt[3]{x^{3}-\sqrt{x^{2}+60}}}{\sqrt{x^{2}-\sqrt[3]{x^{2}+60}}}=\sqrt{3}$

386) $\lim\limits_{n\to\infty}\left(e^{\frac{2020}{n}}-1\right)\ln\left(\prod\limits_{k=1}^{n}\frac{k}{k+n}\right)$

387) $\lim\limits_{x\to\infty}\sqrt[x]{a^{x}+a^{-x}}\ ,\ a>0$

388) $\lim\limits_{x\to 0^{+}}\frac{\ln\left(x^{x}\right)}{\ln\left(\cos x\right)}$

389) $\lim\limits_{n\to\infty}\frac{\sqrt[n]{n!}.\left(1+\frac{1}{2}+\frac{1}{3}+\cdots+\frac{1}{n}\right)}{n\ln n}$

390) $\lim\limits_{x\to a}\frac{a^{2\tan\left(\frac{\pi x}{4a}\right)}+\sqrt[3]{a^{5}x-2x^{6}}}{\ln\left(\frac{2x}{a}-1\right)}\ ,\ \left(a>0\right)=\left(\frac{\pi}{2}\ln a-\frac{11}{6}\right)a^{2}$

391) $\lim\limits_{x\to 2}\frac{\Gamma\left(x\right)+\Gamma\left(x+1\right)+\Gamma\left(x+2\right)-9}{x-2}$

392) $\lim\limits_{x\to 2}\left[\ \Gamma\left(x\right)\ \right]^{\frac{x}{x-2}}=e^{2\left(1-\gamma\right)}$

393) $\lim\limits_{n\to\infty}\sum\limits_{k=1}^{n}\left[\left(a+\sqrt{a+\frac{k^{q-1}}{n^{q}}}\right)^{\frac{1}{2^{p}}}-\left(a+\sqrt{a}\right)^{\frac{1}{2^{p}}}\right]\ ,\ p,q\in\mathbb{N}\ ,\ q\geq 2\ ,\ a\in\mathbb{R}_{+}^{*}$

394) $\lim\limits_{x\to 0}\left(\frac{1}{x^{4}}-\frac{1}{6x^{2}}-\frac{\sin x}{x^{5}}\right)$

395) $\lim\limits_{x\to 0}\left(\frac{x!!!}{x!!}\right)^{\frac{1}{x!-1}}$

396) $\lim\limits_{x\to 0}\dfrac{\sin\Big(\sin 2x-\sin x\Big)-\sin\Big(\tan 2x-\tan x\Big)}{x\Big[\ \sin\Big(\arccos x\Big)-1\ \Big]}=7$

397) $\lim\limits_{x\to 0}\dfrac{e^{x}-e^{x\cos x}}{x-\sin x}=3$

398) $\lim\limits_{n\to\infty}\sum\limits_{k=1}^{n}\left(\dfrac{2^{k-1}}{3^{2^{k-1}}+1}\right)=\dfrac{1}{2}$

399) $\lim\limits_{x\to 0}\dfrac{\sqrt{1-2x}\,.\sqrt[4]{1-4x}\times\cdots\times\sqrt[2n]{1-2nx}-\sqrt[3]{1-3x}\,.\sqrt[5]{1-5x}\times\cdots\times\sqrt[2n+1]{1-\Big(2n+1\Big)x}}{\sqrt{1-2x}\,.\sqrt[3]{1-3x}\,.\sqrt[4]{1-4x}\times\cdots\times\sqrt[n]{1-nx}-1}$

400) $\lim\limits_{x\to 0}\dfrac{\cos\Big(2x\Big).\cos\Big(4x\Big)\times\cdots\times\cos\Big(2nx\Big)-1}{\cos x\,.\cos\Big(2x\Big)\times\cdots\times\cos\Big(nx\Big)-1}$

401) $\lim\limits_{x\to 0}\dfrac{\sqrt{\dfrac{1-2x}{1+2x}}\cdot\sqrt[4]{\dfrac{1-4x}{1+4x}}\times\cdots\times\sqrt[2n]{\dfrac{1-2nx}{1+2nx}}-1}{\sqrt[3]{\dfrac{1-3x}{1+3x}}\cdot\sqrt[5]{\dfrac{1-5x}{1+5x}}\times\cdots\times\sqrt[2n+1]{\dfrac{1-\Big(2n+1\Big)x}{1+\Big(2n+1\Big)x}}-1}$

402) $\lim\limits_{n\to\infty}\dfrac{\left[\ \sqrt[n]{\sum\limits_{k=1}^{25}\Big(2k\Big)^{n}}+\sqrt[n]{\sum\limits_{k=1}^{25}\Big(2k+1\Big)^{n}}\ \right]^{n}}{\sum\limits_{k=1}^{126}k^{n}}$

403) $\lim\limits_{x\to\infty}\left[\ \dfrac{x^{x+1}}{\Big(x+1\Big)^{x}}-\dfrac{\Big(x-1\Big)^{x}}{x^{x-1}}\ \right]=\dfrac{1}{e}$

404) $\lim\limits_{n\to\infty}\left(1+\dfrac{\sqrt[n]{a}-\sqrt[n]{b}}{c}\right)^{n}\ ,\ a\,,b\,,c>0$

405) $\lim\limits_{n\to\infty}\left(2-\dfrac{\sqrt[n]{1^n+2^n+\cdots+2019^n}}{2019}\right)^n$

406) $\lim\limits_{x\to 0^+}\left[\dfrac{(1+x)^{\frac{1}{x}}}{e}\right]^{\frac{1}{x}}=e^{-\frac{1}{2}}$

407) $\lim\limits_{x\to 0}\left[\dfrac{1}{x^2}-\left(1+\dfrac{1}{x^2}\right)\dfrac{\sin^2 x}{x^2}\right]=-\dfrac{2}{3}$

408) $\lim\limits_{x\to 0}\dfrac{1}{x}\left(\dfrac{2}{\sin 2x}+\dfrac{3}{\sin 3x}+\cdots+\dfrac{n}{\sin nx}-\dfrac{n-1}{\sin x}\right)=\dfrac{n(n-1)(2n+5)}{36}$

409) $\lim\limits_{n\to\infty}\dfrac{1}{\sqrt[3]{n}}\left(1+\dfrac{1}{\sqrt[3]{4}}+\dfrac{1}{\sqrt[3]{9}}+\cdots+\dfrac{1}{\sqrt[3]{n^2}}\right)=3$

410) $\lim\limits_{x\to 0}\dfrac{\dfrac{\arcsin x}{\cos x}-x-\dfrac{2}{3}x^3}{x^5}=\dfrac{11}{30}$

411) $\lim\limits_{x\to 2}\dfrac{\sqrt{3x+\dfrac{\sqrt{x+7}}{x-1}}-\sqrt{6x-\dfrac{\sqrt{x+7}}{x-1}}}{\sqrt{x+3\sqrt{x+2}}-2\sqrt{2}}=-\dfrac{64\sqrt{2}}{63}$

412) $\lim\limits_{x\to 0}\dfrac{2+\tan\left(e^x-\cos x\right)-e^x-chx}{x\left(\sqrt{1+2x}-\sqrt[3]{1+3x}\right)}$

413) $\lim\limits_{h\to 0}\dfrac{\sin^7\left(\dfrac{\pi}{6}+\dfrac{h}{2}\right)-\left(\dfrac{1}{2}\right)^7}{h}$

414) $\displaystyle\lim_{x\to\cos\left(\frac{\pi}{18}\right)+\cos\left(\frac{11\pi}{18}\right)+\cos\left(\frac{13\pi}{18}\right)} \frac{\cos\Big(\cos x\Big)-\sin\Big(\sin x\Big)-\cos\Big[\ \ln\Big(\cos x\Big)\ \Big]}{\tan\Big(\tan x\Big)}$

415) $\displaystyle\lim_{n\to\infty} n\left(\sqrt{\frac{2}{3}}-\sqrt{\frac{n+\sqrt{n^2+1}}{3n+1}}\right)=\frac{1}{3\sqrt{6}}$

416) $\displaystyle\lim_{n\to\infty}\left[\ \frac{1}{\sqrt{3}\left(\sqrt{3}-\sqrt{2}\right)}-\sqrt{\frac{n+\sqrt{n^2+1}}{3n+1}}\ \right]^{\sqrt{n}}=1$

417) $\displaystyle\lim_{s\to1}\left[\ \zeta\Big(s\Big)-\frac{1}{s-1}\ \right]$

418) $\displaystyle\lim_{x\to0}\frac{1-\left[\ \tan\left(x+\frac{\pi}{4}\right)\right]^{n-1}\times\left[\ \tan\left(2x+\frac{\pi}{4}\right)\right]^{n-2}\times\cdots\times\left[\ \tan\left(lx+\frac{\pi}{4}\right)\right]^{n-l}}{1-\Big(1-nx\Big)^{x}\times\Big(2-nx\Big)^{2x}\times\cdots\times\Big(\phi-nx\Big)^{\phi x}}$

419) $\displaystyle\lim_{x\to1}\frac{\int_{x-1}^{e^x-e}\cos\Big(t^5\Big)dt}{3^x-3}$

420) $\displaystyle\lim_{n\to\infty}e^{-n}\sum_{k=0}^{n}\frac{n^k}{k!}=\frac{1}{2}$

421) $\displaystyle\lim_{x\to0}\frac{\ln\left(\frac{1+x}{1-x}\right)}{\tan^{-1}\Big(1+x\Big)-\tan^{-1}\Big(1-x\Big)}=2$

422) $\displaystyle\lim_{x\to a}\left(\frac{a\csc x}{x\csc a}\right)^{\frac{1}{x-a}}=\frac{1}{e^{\frac{a\cot a+1}{a}}}$

423) $\lim\limits_{x\to 0}\dfrac{\dfrac{\sin x}{x}+\dfrac{\tan x}{x}-2}{x^2}=\dfrac{1}{6}$

424) $\lim\limits_{x\to\infty}x^2\sin\left(\ln\sqrt{\cos\dfrac{\pi}{x}}\right)=-\dfrac{\pi^2}{4}$

425) $\lim\limits_{x\to 0}\sqrt[x]{2a^x+x-1}=a^2e$

426) $\lim\limits_{x\to 2}\left(2^x+3^x-12\right)^{\tan\left(\frac{\pi x}{4}\right)}=\left(2^4\times 3^9\right)^{-\frac{4}{\pi}}$

427) $\lim\limits_{x\to 0}\dfrac{2^{1+x}+2^{1-x}-4}{x^2}=2\ln^2 2$

428) $\lim\limits_{x\to 2}\dfrac{\ln\left(4-x\right)-\ln 2}{\ln\left(x^2+3x-9\right)}=-\dfrac{1}{14}$

429) $\lim\limits_{x\to 0}\dfrac{\cos\left(ax\right)-\cos\left(bx\right)}{x^2}=\dfrac{b^2-a^2}{2}$

430) $\lim\limits_{x\to a}\dfrac{a^x-x^a}{x-a}=a^a\left(\ln a-1\right)$

431) $\lim\limits_{x\to\infty}\cos\left[\ \ln\left(n+1\right)-\ln\left(n-1\right)\ \right]^{\left(n+1\right)^2}=\dfrac{1}{e^2}$

432) $\lim\limits_{x\to 0}\left(\sin\dfrac{x}{m}+\cos\dfrac{3x}{m}\right)^{\frac{2m}{x}}=e^2$

433) $\lim\limits_{x\to\infty}\left[\left(\dfrac{e}{1-e}\right)\left(\dfrac{1}{e}-\dfrac{x}{1+x}\right)\right]^x=e^{\frac{e}{1-e}}$

434) $\lim\limits_{x\to 1}\dfrac{a^{\ln x}-b^{\ln x}}{x-1}=\ln\left(\dfrac{a}{b}\right)$

435) $\lim\limits_{x\to 0}\dfrac{e^{x^n\sin(ax)}-1}{x\ln\left(x^n+1\right)}=a$

436) $\lim\limits_{x\to 0}\left[\ \ln\left(x^2+e\right)\ \right]^{\frac{1}{\cos x-1}}=e^{-\frac{2}{e}}$

437) $\lim\limits_{x\to 1}\dfrac{\ln\left[\dfrac{b^x-a^x}{(b-a)x}\right]}{x-1}=\ln\left[\left(\dfrac{b^b}{a^a}\right)^{\frac{1}{b-a}}\right]-1$

438) $\lim\limits_{n\to\infty}\left(\dfrac{C_{3n}^{2n}}{C_{2n}^{n}}\right)^{\frac{1}{n}}=\dfrac{27}{4}$

439) $\lim\limits_{x\to 0}\dfrac{1-\cos\left(\sin x\right)}{x^2}=\dfrac{1}{2}$

440) $\lim\limits_{x\to e}\dfrac{\ln\left(2x-e\right)-1}{x-e}=\dfrac{2}{e}$

441) $\lim\limits_{x\to 0}\dfrac{\ln\left(2x^2+\cos 2x\right)}{x^4}=\dfrac{2}{3}$

442) $\lim\limits_{x\to 0}\dfrac{\cos x-\sqrt[4]{\cos x}}{\sin^2 x}=-\dfrac{3}{8}$

443) $\lim\limits_{x\to 0^+}\left[\dfrac{\left(1+x\right)^{\frac{1}{x}}}{e}\right]^{\frac{1}{x}}=e^{-\frac{1}{2}}$

444) $\lim\limits_{x\to 0}\left(\dfrac{a^{x+1}+b^{x+1}+c^{x+1}}{a+b+c}\right)^{\frac{1}{x}}=\left(a^{a}b^{b}c^{c}\right)^{\frac{1}{a+b+c}}$

445) $\lim\limits_{x\to 1}\dfrac{\left(\tan\sqrt{3x+2}-\tan\sqrt{2x+3}\right)\left(\tan\sqrt{4x+3}-\tan\sqrt{3x+4}\right)}{\left(\tan\sqrt{5x+4}-\tan\sqrt{4x+5}\right)\left(\tan\sqrt{6x+5}-\tan\sqrt{5x+6}\right)}$

$=\dfrac{3}{\sqrt{5}}\times\sqrt{\dfrac{11}{7}}\times\left(\dfrac{\cos 3\,.\cos\sqrt{11}}{\cos\sqrt{5}\,.\cos\sqrt{7}}\right)^{2}$

446) $\lim\limits_{x\to -a}\dfrac{x^{2}\left(x+b\right)+2ax\left(x+b\right)+a^{2}\left(x+b\right)}{x^{2}\left(x+a\right)+2bx\left(x+a\right)+b^{2}\left(x+a\right)}=0$

447) $\lim\limits_{x\to +\infty}\left[e\sqrt{x^{2}-x+1}-x\left(1+\dfrac{1}{x}\right)^{x}\right]=0$

448) $\lim\limits_{x\to -a}\dfrac{x^{2}+4ax+3a^{2}}{x^{2}+\left(a+b\right)x+ab}=\dfrac{2a}{b-a}$

449) $\lim\limits_{x\to 0}\dfrac{x^{3}-\sin^{2}x+x\ln\sqrt{1+2x}}{x^{4}}=\dfrac{5}{3}$

450) $\lim\limits_{n\to\infty}n^{k}\int_{na}^{nb}\dfrac{x}{1+x^{k+2}}\,dx=\dfrac{1}{k}\left(\dfrac{1}{a^{k}}-\dfrac{1}{b^{k}}\right)$

451) $\lim\limits_{x\to a}\dfrac{\sqrt[n]{\sin x}-\sqrt[n]{\sin a}}{\sqrt[m]{x^x}-\sqrt[m]{a^a}}=\dfrac{m\cot a\,.\sqrt[n]{\sin a}}{n\,.\sqrt[m]{a^a}\,.\left(1+\ln a\right)}$

452) $\lim\limits_{x\to 0}\dfrac{\sin x-x}{2e^x-x^2-2x-2}=-\dfrac{1}{2}$

453) $\lim\limits_{x\to\infty}\dfrac{\left(\int_0^x e^{t^2}dt\right)^2}{\int_0^x e^{2t^2}dt}=0$

454) $\lim\limits_{x\to 0}\dfrac{4\sin x-\sin 4x}{3\sin x-\sin 3x}=\dfrac{5}{2}$

455) $\lim\limits_{n\to\infty}\dfrac{1}{n^2}\times\sqrt{\sum_{k=0}^{-1}\left[\left(n^2-nk\right)^2.C_{2n}^k\right]}=0$

456) $\lim\limits_{n\to+\infty}\dfrac{1}{n}\times\int_{\frac{1}{n}}^{1}\dfrac{dx}{x\left(1+x\sqrt{x\,.\sqrt[3]{x\times\cdots\times x\,.\sqrt[n]{x}}}\right)}=0$

457) $\lim\limits_{\varepsilon\to 0^-}\int_{-1}^{\varepsilon}\sqrt{\dfrac{1+e^x}{1-e^x}}\,dx=2\tan^{-1}\left(\sqrt{\dfrac{e-1}{e+1}}\right)+\ln\left(\dfrac{\sqrt{e+1}+\sqrt{e-1}}{\sqrt{e+1}-\sqrt{e-1}}\right)$

458) $\lim\limits_{\varepsilon\to 0^+}\int_{\varepsilon}^{1}\dfrac{x\log x}{1-x^2+x^4}\,dx=-\dfrac{1}{144}\left[\psi^1\left(\dfrac{1}{3}\right)+\psi^1\left(\dfrac{1}{6}\right)-\psi^1\left(\dfrac{5}{6}\right)-\psi^1\left(\dfrac{2}{3}\right)\right]$

459) $\lim\limits_{n\to\infty}\sum_{i=1}^{n}\sum_{j=1}^{i}\sum_{k=1}^{j}\sum_{l=1}^{k}\left(\dfrac{1}{2^{i+j+k+l}}\right)=\dfrac{64}{315}$

460) $\lim\limits_{x\to 0}\dfrac{1+x+\dfrac{x^2}{2}-\dfrac{\cos x}{1-x}}{x^3}=-\dfrac{1}{2}$

461) $\lim\limits_{n\to+\infty}\dfrac{n+2n+3n+\cdots+n^2}{1^2+2^2+3^2+\cdots+n^2}=\dfrac{3}{2}$

462) $\lim\limits_{n\to+\infty}\dfrac{1+n+n^2+\cdots+n^n}{n^{n-1}}=+\infty$

463) $\lim\limits_{n\to+\infty}\prod\limits_{k=1}^{n}\sqrt[n]{\dfrac{n}{k}}=e$

464) $\lim\limits_{x\to1}\dfrac{\sqrt{2x+\sqrt{3x+\sqrt{x}}}-\left(x+x^2\right)}{x-1}=-\dfrac{61}{16}$

465) $\lim\limits_{x\to0}\dfrac{ax-\sin\left(ax\right)}{bx-\sin\left(bx\right)},\left(a,b\neq0\ ,\ a\neq b\right)=\left(\dfrac{a}{b}\right)^3$

466) $\lim\limits_{x\to\frac{\pi}{4}}\dfrac{1-\sin\sqrt{x}}{\left(\dfrac{2x}{\pi}-\dfrac{\pi}{2}\right)^2}=\dfrac{1}{8}$

467) $\lim\limits_{x\to0}\dfrac{\left(x+1\right)\sin\left(\dfrac{x}{x+1}\right)-\sin x}{x^4}=\dfrac{1}{3}$

468) $\lim\limits_{x\to0}\dfrac{2x-x^2-\ln\left(1+2x+x^2\right)}{2x-\sin2x}=-\dfrac{1}{2}$

469) $\lim\limits_{n\to\infty}\sum\limits_{k=1}^{n}\left[\left(1+\dfrac{k^{q-1}}{n^p}\right)^{\frac{1}{p}}-1\right],\left(p\neq0\ ,\ q>0\right)=\dfrac{1}{pq}$

470) $\lim\limits_{n\to\infty}n^4\sin\left[\ \pi\left(-1\right)^n\sin\left(\pi n\sqrt{n^2+1}\right)\ \right]=\dfrac{\pi^3}{128}$

471) $\lim\limits_{n\to\infty}\dfrac{\sqrt{n}\,.\left(n!\right)^2.2^{2n+2}}{\left(2n+1\right)!}=2\sqrt{\pi}$

472) $\lim\limits_{n\to\infty}\left(2^{7n}\sin\left(\dfrac{7}{2}\displaystyle\int_{2^{8n}}^{2^{16n}}\dfrac{dx}{\sqrt[8]{x}\,.\left(1+16x\sqrt{x\sqrt{x}}\right)}\right)\right)=\dfrac{1}{4}$

473) $\lim\limits_{n\to\infty}\dfrac{1}{n}\displaystyle\int_{2^{n-n^2}}^{3^{n+n^2}}\dfrac{dx}{\sqrt[n]{x^{n+3}}+5.\sqrt[n+1]{x^{n+2+\frac{1}{n}}}+4.\sqrt[n+2]{x^{\frac{n^3+3n^2-4}{n^2+2n}}}}$

474) $\lim\limits_{n\to\infty}\prod_{k=1}^{\infty}\left[1+\dfrac{n\tan^{-1}\left(\dfrac{k}{n}\right)}{k^2+n^2}\right]=e^{\frac{\pi^2}{32}}$

475) $\lim\limits_{n\to\infty}\left[\dfrac{1+\dfrac{1}{2}+\dfrac{1}{3}+\cdots+\dfrac{1}{n^{2020}}}{\log n}\right]=2020$

476) $\lim\limits_{n\to\infty}\left[n\left(\sqrt[n]{4}-1\right)-2\sum_{p=3}^{\infty}\dfrac{\left(-1\right)^{p+1}}{p}\right]^{2n}=4^{\ln 4}$

477) $\lim\limits_{n\to\infty}\dfrac{e^n\left(n!\right)}{n^n.\sqrt{n}}=\sqrt{2\pi}$

478) $\lim\limits_{x\to 0}\dfrac{\left(1+\sin x\right)^{\frac{1}{3}}-\left(1-\sin x\right)^{\frac{1}{3}}}{x}=\dfrac{2}{3}$

479) $\lim\limits_{n\to\infty}\left(\dfrac{\sqrt[n]{a^n+b}+\sqrt[n]{a+b^n}}{a+b}\right)^{na^nb^n}\quad,\ a,b>1$

480) $\lim\limits_{n\to\infty}\left[\dfrac{1}{n^2}\lim\limits_{x\to 0}\dfrac{1-\sqrt[3]{\cos x}\,.\sqrt[5]{\cos 3x}\times\cdots\times\sqrt[2n+1]{\cos\left(\left(2n-1\right)x\right)}}{x^2}\right]$

481) $\lim\limits_{x\to\infty}\dfrac{\sqrt{\left(1+x\right)^x.\sqrt[3]{\left(1+x\right)^x.\sqrt[4]{\left(1+x\right)^x.\sqrt[5]{\cdots\cdots}}}}}{\sqrt{x^x.\sqrt[3]{x^x.\sqrt[4]{x^x.\sqrt[5]{\cdots\cdots}}}}}$

482) $\lim\limits_{n\to\infty}\left[\lim\limits_{x\to 0}\dfrac{2\sqrt[3]{1+x}+2\sqrt[3]{8+x}+\cdots+2\sqrt[3]{n^3+x}-n\left(n+1\right)}{x}\right]$

483) $\lim\limits_{n\to\infty}\left[\lim\limits_{x\to 0}\dfrac{2\sqrt{1+x}+2\sqrt{4+x}+\cdots+2\sqrt{n^2+x}-n\left(n+1\right)}{x}-\ln n\right]$

484) $\lim\limits_{n\to\infty}\left[\lim\limits_{x\to 0}\dfrac{\overbrace{\left(\tan x\right)^{\left(\tan x\right)^{\left(\tan x\right)^{\cdot^{\cdot^{\cdot}}}}}}^{n\ times}}{\underbrace{x^{x^{x^{\cdot^{\cdot^{\cdot}}}}}}_{n\ times}}\right]=1$

485) $\lim\limits_{n\to\infty}\dfrac{\sqrt[p]{n}-\sqrt[p]{n-1}+\sqrt[p]{n-2}-\sqrt[p]{n-3}+\cdots+\left(-1\right)^{n-1}}{\sqrt[np]{n!}}$

486) $\lim\limits_{x\to 0}\left[e^{\pi}.\sqrt[12]{\left(1+\sin 2x\right)^{\frac{\pi^3}{x}}}.\sqrt[80]{\left(1+\sin 4x\right)^{\frac{\pi^5}{x}}}.\sqrt[252]{\left(1+\sin 6x\right)^{\frac{\pi^7}{x}}}\times\cdots\cdots \right]$

487) $\lim\limits_{x\to 0}\left(\dfrac{5^x-1}{x^{n+1}}-\dfrac{\log 5}{x^n}-\dfrac{\log^2 5}{2x^{n-2}}-\cdots-\dfrac{\log^n 5}{n!.x} \right),\ n\in\mathbb{N}, n\geq 2$

488) $\lim\limits_{n\to\infty}\left[\dfrac{\ln\left(n+1\right)-\ln n}{n+1}+\dfrac{\ln\left(n+2\right)-\ln n}{n+2}+\cdots+\dfrac{\ln\left(n+n\right)-\ln n}{n+n} \right]$

489) $\lim\limits_{x\to 1}\left(\cos x+\dfrac{1}{2!}-\dfrac{1}{4!}+\dfrac{1}{6!}-\dfrac{1}{8!}+\cdots \right)^{\frac{1}{x-1}}$

490) $\lim\limits_{x\to 1}\left(\cos x+\dfrac{1}{2!}-\dfrac{1}{4!}+\dfrac{1}{6!}-\dfrac{1}{8!}+\cdots \right)^{\frac{1}{\cos x-\cos 1}}$

491) $\lim\limits_{x\to 4}\dfrac{2-\sqrt[3]{\Gamma\left(x\right)+2}}{x-4}$

492) $\lim\limits_{x\to 1}\dfrac{x^{\Gamma(x)}-1}{\left(\Gamma\left(x\right)\right)^{\Gamma(x)}-1}\times\dfrac{x^{x\Gamma(x)}-1}{\left(\Gamma\left(x\right)\right)^{x\Gamma(x)}-1}$

493) $\lim\limits_{x\to 2}\dfrac{1+\cos\left[\ \pi\Gamma\left(x\right)\ \right]}{\left(x-2\right)^2}$

494) $\lim\limits_{n\to\infty}\dfrac{3^n\left[\ \left(2n-1\right)!!+\left(2n\right)!!\ \right]}{H_{n+1}\left(2n^2+1\right)^n+H_n\left(2n^2+6n+4\right)^n}$

495) $\lim\limits_{n\to\infty}\dfrac{\sqrt[n]{n!}.\sqrt[n+1]{(2n+1)!!}}{\sqrt[n]{\prod\limits_{k=2}^{n}k.\sqrt[k]{k!}}}$

496) $\lim\limits_{n\to\infty}\dfrac{1}{n}\sum\limits_{k=2}^{n}\dfrac{k}{\sqrt[k]{(2k-1)!!}}=\dfrac{e}{2}$

497) $\lim\limits_{n\to\infty}\dfrac{1}{n}\sum\limits_{k=2}^{n}\dfrac{k}{\sqrt[k]{k!}}=e$

498) $\lim\limits_{n\to\infty}\dfrac{1}{n}\sum\limits_{k=1}^{n}\dfrac{k^2}{\sqrt[k]{(k!)^2}}=e^2$

499) $\lim\limits_{n\to\infty}\dfrac{1}{n^3}\sum\limits_{k=2}^{n}\sqrt[k]{(k!).(2k-1)!!}=\dfrac{2}{3e^2}$

500) $\lim\limits_{a\to b}\dfrac{\sqrt{a+x}+\sqrt{b+x}-2\sqrt{x+\dfrac{a+b}{2}}}{\sqrt{a+x}-\sqrt{b+x}}$

501) $\lim\limits_{x\to 0}\dfrac{\sin\left(\pi\sqrt{x+1}-\dfrac{\pi}{2}x\right)}{x^2}=\dfrac{\pi}{8}$

502) $\lim\limits_{n\to\infty}\dfrac{\sqrt[n]{\sqrt{2!}\times\sqrt[3]{3!}\times\cdots\times\sqrt[n]{n!}}}{\sqrt[n+1]{(2n+1)!!}}=\dfrac{1}{2e}$

503) $\lim\limits_{x\to 0}\dfrac{5\ln\left(e^2-3x\right).\ln\left(e^3+4x\right)-7\ln\left(e^4-5x\right)-2}{\ln\left(e^2+3x\right).\ln\left(e^3+2x\right).\ln\left(e^4-6x\right)-24}=\dfrac{-45e^2+40e+35}{36e^2+16e-36}$

504) $\lim\limits_{x\to 0}\left(1+\log^{2}_{\cos\frac{x}{2}}\cos x\right)^{2}=e^{\frac{1}{8}}$

505) $\lim\limits_{x\to 2}\dfrac{4\sin^{2}\left(x-2\right)-\sin^{2}\left(2x-4\right)}{\left(x-2\right)^{4}}=4$

506) $\lim\limits_{x\to 0}\dfrac{\arctan x-\sin x}{\tan x-\arcsin x}=-1$

507) $\lim\limits_{x\to a}\dfrac{\sqrt{ax}-a^{2}x^{-1}}{1-ax^{-1}}=\dfrac{3}{2}a$

508) $\lim\limits_{n\to\infty}\dfrac{1+2\sqrt{e}+3.\sqrt[3]{e}+\cdots+n.\sqrt[n]{e}}{n^{2}}=\dfrac{1}{2}$

509) $\lim\limits_{n\to+\infty}\dfrac{1+\dfrac{1}{2}+\dfrac{1}{3}+\cdots+\dfrac{1}{n}}{\ln\left(n+1\right)}=1$

510) $\lim\limits_{n\to+\infty}\dfrac{n+\dfrac{n-1}{2}+\dfrac{n-2}{3}+\cdots+\dfrac{2}{n-1}+\dfrac{1}{n}}{\ln\left[\left(n+1\right)!\right]}=1$

511) $\lim\limits_{n\to+\infty}\dfrac{\ln\left(n!\right)}{n}=+\infty$

512) $\lim\limits_{n\to+\infty}\left(\dfrac{2}{n}+\dfrac{3}{2n}+\dfrac{4}{3n}+\cdots+\dfrac{n-1}{n^{2}}\right)=1$

513) $\lim\limits_{n\to+\infty}\dfrac{1+\sqrt{2}+\sqrt[3]{3}+\cdots+\sqrt[n]{n}}{n}=1$

514) $\lim\limits_{x\to+\infty}\ln x.\ln\left(1-\dfrac{1}{x}\right)=0$

515) $\lim\limits_{n\to+\infty}\dfrac{1+2!+3!+\cdots+n!}{n!}=1$

516) $\lim\limits_{n\to\infty}\dfrac{3+\sqrt{3}+\sqrt[3]{3}+\cdots+\sqrt[n]{3}}{\ln\left(n^2+1\right)}=\ln\sqrt{3}$

517) $\lim\limits_{n\to\infty} n\sin\left(2\pi e.n!\right)=2\pi$

518) $\lim\limits_{x\to1}\left(e^{\sin a}-e^{\sin ax}\right).\tan\left(\dfrac{\pi x}{2}\right)=\dfrac{2a}{\pi}\cos a.e^{\sin a}$

519) $\lim\limits_{x\to\frac{\pi}{4}}\left(\cos x-\dfrac{\sqrt{2}}{2}\right).\sec 2x=\dfrac{\sqrt{2}}{4}$

520) $\lim\limits_{n\to\infty}\dfrac{1}{n}\prod\limits_{k=n!}^{(n+1)!}\sqrt[k]{e}=1$

521) $\lim\limits_{n\to\infty}\sum\limits_{k=n^n}^{(n+1)^n}\dfrac{1}{k}=1$

522) $\lim\limits_{n\to\infty}\dfrac{1+\dfrac{1}{2}+\dfrac{1}{3}+\cdots+\dfrac{1}{n}}{n}=0$

523) $\lim\limits_{n\to+\infty}\dfrac{\ln\left(n!\right)-n\ln n}{n}=-1$

524) $\lim\limits_{n\to\infty}\dfrac{1+\dfrac{1}{\sqrt[3]{2}}+\dfrac{1}{\sqrt[3]{3}}+\cdots+\dfrac{1}{\sqrt[3]{n}}}{n^{\frac{2}{3}}}=\dfrac{3}{2}$

525) $\lim\limits_{n\to\infty}\dfrac{1+\dfrac{1}{\sqrt[5]{2}}+\dfrac{1}{\sqrt[5]{3}}+\cdots+\dfrac{1}{\sqrt[5]{n}}}{n^{\frac{4}{5}}}=\dfrac{5}{4}$

526) $\lim\limits_{n\to\infty}\left[\ n\left(\dfrac{4}{5}\right)^{n}+n^{2}\sin^{n}\dfrac{\pi}{6}+\cos\left(2n\pi+\dfrac{\pi}{n}\right)\ \right]=1$

527) $\lim\limits_{n\to\infty}\sum\limits_{k=1}^{n}\dfrac{k!.k}{\left(n+1\right)!}=1$

528) $\lim\limits_{n\to\infty}\sqrt[n]{\dfrac{3^{3n}.\left(n!\right)^{3}}{\left(3n\right)!}}=1$

529) $\lim\limits_{n\to\infty}\sqrt[n]{\alpha_{1}^{n}+\alpha_{2}^{n}+\cdots+\alpha_{p}^{n}}=\max\left\{\ \alpha_{1},\alpha_{2},\ldots,\alpha_{p}\ \right\}$

$p\in\mathbb{N}\ ,\ \alpha_{1},\alpha_{2},\ldots,\alpha_{p}\in\mathbb{R}_{+}^{*}\ \&\ \alpha_{1}\neq\alpha_{2}\neq\ldots\neq\alpha_{p}$

530) $\lim\limits_{x\to0}\dfrac{\ln\left(1+x+x^{2}+\cdots+x^{n}\right)}{nx}\ ,\left(n\in\mathbb{N}^{*}\right)=\dfrac{1}{n}$

531) $\lim\limits_{n\to\infty}\left(n^{2}+n-\sum\limits_{k=1}^{n}\dfrac{2k^{3}+8k^{2}+6k-1}{k^{2}+4k+3}\right)=\dfrac{5}{12}$

532) $\lim\limits_{n\to\infty}n^{k}\left(\sqrt{\dfrac{n}{n+1}}-\sqrt{\dfrac{n+2}{n+3}}\right)=\begin{cases}0\ \ if\ \ k<2\\-1\ \ if\ \ k=2\\-\infty\ \ if\ \ k>2\end{cases}$

533) $\lim\limits_{n\to\infty} n^k\left(a^{\frac{1}{n}}-1\right)\left(\sqrt{\frac{n-1}{n}}-\sqrt{\frac{n+1}{n+2}}\right)=\begin{cases}0 \;\; if \;\; k\in\left\{0,1,2\right\}\\ -\ln a \;\; if \;\; k=3\\ \infty \;\; if \;\; k\geq 4 \;\; and \;\; a\in\left]0,1\right[\\ -\infty \;\; if \;\; k\geq 4 \;\; and \;\; a>1\end{cases}$

ដែល $k\in\mathbb{N}$, $a\in\mathbb{R}_+\setminus\left\{1\right\}$

534) $\lim\limits_{n\to\infty}\dfrac{n!}{\left(1+1^2\right)\left(1+2^2\right)\times\cdots\times\left(1+n^2\right)}=0$

535) $\lim\limits_{n\to\infty}\dfrac{\left(n+1\right)^k-n^k}{C_n^{k-1}}\;,\;\left(n>k\right)=k!$

536) $\lim\limits_{n\to\infty}\left(n+1-\sum_{i=2}^{n}\sum_{k=2}^{i}\dfrac{k-1}{k!}\right)=e$

537) $\lim\limits_{n\to\infty}\dfrac{1^1+2^2+3^3+\cdots+n^n}{n^n}=1$

538) $\lim\limits_{n\to\infty}\sum_{k=1}^{n}\dfrac{\left\lfloor k^2a\right\rfloor}{n^3}\;,\left(a\in\mathbb{R}\right)=\dfrac{a}{3}$

539) $\lim\limits_{n\to\infty}2^n\left[\sum_{k=1}^{n}\dfrac{1}{k\left(k+2\right)}-\dfrac{1}{4}\right]^n=e^{-2}$

540) $\lim\limits_{n\to\infty}\dfrac{1+2\sqrt{2}+3\sqrt{3}+\cdots+n\sqrt{n}}{n^2.\sqrt{n}}=\dfrac{2}{5}$

541) $\lim\limits_{x\to\frac{\pi}{2}}\left(\sin x\right)^{\frac{1}{2x-\pi}}=1$

542) $\lim\limits_{n\to\infty} n^2 \ln\left(\cos\dfrac{1}{n}\right) = -\dfrac{1}{2}$

543) $\lim\limits_{x\to 1^-} \dfrac{\sin\left(n\arccos x\right)}{\sqrt{1-x^2}}\ , \left(n\in\mathbb{N}^*\right) = n$

544) $\lim\limits_{x\to 1^-} \dfrac{1-\cos\left(n\arccos x\right)}{1-x^2}\ , \left(n\in\mathbb{N}^*\right) = \dfrac{n^2}{2}$

545) $\lim\limits_{n\to\infty} \cos\left(n\pi.\sqrt[2n]{e}\right) = 0$

546) $\lim\limits_{n\to\infty} \sqrt[n]{\prod\limits_{k=1}^{n} C_n^k} = \infty$

547) $\lim\limits_{n\to\infty} \dfrac{a+\sqrt{a}+\sqrt[3]{a}+\cdots+\sqrt[n]{a}-n}{\ln n} = \ln a$

548) $\lim\limits_{n\to\infty} n\ln\left[\ \tan\left(\dfrac{\pi}{4}+\dfrac{\pi}{n}\right)\right] = 2\pi$

549) $\lim\limits_{n\to\infty} \sin\left(n\pi.\sqrt[3]{n^3+3n^2+4n-5}\right) = \dfrac{\sqrt{3}}{2}$

550) $\lim\limits_{x\to 1^-} \dfrac{2\arcsin x-\pi}{\sin\left(\pi x\right)} = -\infty$

551) $\lim\limits_{n\to\infty} \sum\limits_{k=2}^{n} \dfrac{1}{k\ln k} = \infty$

552) $\lim\limits_{n\to\infty}\left[\ \lim\limits_{x\to 0}\left(1+\sum\limits_{k=1}^{n}\sin^2 kx\right)^{\frac{1}{n^3x^2}}\right] = \sqrt[3]{e}$

553) $\lim\limits_{n\to\infty}\sum\limits_{k=0}^{n}\dfrac{\left(k+1\right)\left(k+2\right)\times\cdots\times\left(k+p\right)}{n^{p+1}}=\dfrac{1}{p+1}$

554) $\lim\limits_{n\to\infty}\sum\limits_{k=1}^{n}\dfrac{\sqrt{C_{n+k}^{2}}}{n^{2}}=\dfrac{3}{2\sqrt{2}}$

555) $\lim\limits_{n\to\infty}\dfrac{\left(n+1\right)^{\alpha}-n^{\alpha}}{n^{\alpha-1}}\,,\left(\alpha>0\right)=\alpha$

556) $\lim\limits_{n\to\infty}\dfrac{1+\sqrt[2]{2!}+\sqrt[3]{3!}+\cdots+\sqrt[n]{n!}}{n}=1$

557) $\lim\limits_{x\to 0}\dfrac{2^{\arctan x}-2^{\arcsin x}}{2^{\tan x}-2^{\sin x}}=-1$

558) $\lim\limits_{x\to\infty}\left[\dfrac{x^{x+1}+\left(x+1\right)^{x}}{x^{x+1}}\right]^{x}=e^{e}$

559) $\lim\limits_{x\to 0}\dfrac{\sqrt{x^{2}+1}+x-e^{x}}{x^{2}e^{x}}=0$

560) $\lim\limits_{x\to\frac{\pi}{2}}\dfrac{\sin x\,.\cos 2x+1}{\left(2x-\pi\right)^{2}}=\dfrac{5}{8}$

561) $\lim\limits_{x\to 1}\sec\left(\dfrac{\pi}{2^{x}}\right).\ln x=-\dfrac{2}{\pi\ln 2}$

562) $\lim\limits_{x\to 0}\dfrac{2^{x}-3^{x}}{\left(1+x\right)^{\frac{2}{3}}-1}=\dfrac{3}{2}\ln\left(\dfrac{2}{3}\right)$

563) $\lim\limits_{x\to a}\dfrac{\sin\left[\ \ln\left(x-a+1\right)\ \right]}{\ln\left(e^{x}-e^{a}+1\right)}=e^{-a}$

564) $\lim\limits_{x\to a}\dfrac{f\left(x^{x}\right)-f\left(a^{x}\right)}{f\left(x^{a}\right)-f\left(a^{a}\right)}$

565) $\lim\limits_{x\to\infty}\dfrac{\sin\left[\left(1+\dfrac{1}{x}\right)^{n}\right]-\sin\left[\left(1-\dfrac{1}{x}\right)^{n}\right]}{\cos\left(\sqrt[n]{2x+1}\right)-\cos\left(\sqrt[n]{x+1}\right)}\ ,\ n\in\mathbb{N}$

566) $\lim\limits_{n\to\infty}\dfrac{e^{n}.\left(n!\right)}{n^{n}.\sqrt{n}}=\sqrt{2\pi}$

567) $\lim\limits_{x\to 0}\dfrac{\left(1+\sin x\right)^{\frac{1}{3}}-\left(1-\sin x\right)^{\frac{1}{3}}}{x}=\dfrac{2}{3}$

568) $\lim\limits_{n\to\infty}\sqrt[n]{2\sum\limits_{0\le i\le j\le n}C_{n}^{i}C_{n}^{j}+\dfrac{1}{2}\sum\limits_{i=0}^{n}\sum\limits_{j=0}^{n}C_{n}^{i}C_{n}^{j}}=4$

569) $\lim\limits_{x\to 0}\left(\dfrac{e^{x}-1}{x}\right)^{\frac{1}{\sin x}}=e^{\frac{1}{2}}$

570) $\lim\limits_{n\to\infty}\left[\sqrt[2n]{\dfrac{n^{n}.n!!.\left(n-1\right)!!}{\left(2n-1\right)!!.\left(2^{n}n!\right)}}\ \right]\times\dfrac{n}{\sqrt[n]{\left(2n\right)!!}}=\dfrac{e^{2}}{4\sqrt{e}}$

571) $\lim\limits_{x\to 0}\dfrac{1}{x^{3}}\left[\left(\dfrac{2+\cos x}{3}\right)^{x}-1\ \right]=-\dfrac{1}{6}$

572) $\lim\limits_{n\to\infty}\left(\dfrac{3\sum\limits_{k=1}^{n}\left(\sum\limits_{i=1}^{k}\int_{i+2}^{i+3}\dfrac{dx}{x^2-\left(1+2i\right)x+i^2+i}\right)^2}{\left(1+n^3\right)\log^2\left(\dfrac{4}{3}\right)}\right)^{\frac{2n\pi}{3}}=e^{\pi}$

573) $\lim\limits_{n\to\infty}\left[\dfrac{16^n}{\left(C_2^1C_4^2C_6^3\times\cdots\times C_{2n}^n\right)^2}-n\right]=-\infty$

574) $\lim\limits_{x\to 0}\dfrac{\sin\left[\dfrac{3\pi}{2}\left(\dfrac{\sin x}{x}\right)\right]+\sin\left[\dfrac{\pi}{2}\left(\dfrac{\sin x}{x}\right)\right]}{\dfrac{\pi^2}{36}x^4}=1$

575) $\lim\limits_{x\to\infty}\dfrac{x\left(x^{\frac{1}{x}}+x^{\frac{2}{x}}+\cdots+x^{\frac{2020}{x}}-2020\right)}{\ln x}=2041210$

576) $\lim\limits_{n\to\infty}\sum\limits_{x=1}^{n}\dfrac{4}{16x^2-16x+3}=\dfrac{\pi}{2}$

577) $\lim\limits_{n\to+\infty}\sum\limits_{p=n+1}^{kn}\dfrac{1}{p}\ ,\left(k\in\mathbb{N}\ ,k\geq 2\right)=\ln k$

578) $\lim\limits_{x\to 0}\dfrac{1+2x^2-\cos x}{1-2x^2-\cos x}=-\dfrac{5}{3}$

579) $\lim\limits_{x\to 2}\left(4-e^x+\dfrac{2^2}{2!}+\dfrac{2^3}{3!}+\dfrac{2^4}{4!}+\cdots\right)^{\frac{1}{x-2}}=e^{-e^2}$

580) $\lim\limits_{x\to 1}\left(x-\sin x+1-\dfrac{1}{3!}+\dfrac{1}{5!}-\dfrac{1}{7!}+\cdots\right)^{\frac{1}{x-1}}=e^{1-\cos 1}$

581) $\lim\limits_{n\to\infty}\sum\limits_{k=1}^{n}\left(2^{\frac{k^2}{n^3}}-1\right)=\dfrac{\ln 2}{3}$

582) $\lim\limits_{x\to 1}\dfrac{\left(4^{x-1}-x\right).\ln\left(\dfrac{1+x}{2}\right)}{\left[\left(7+x\right)^{\frac{1}{3}}-\left(1+3x\right)^{\frac{1}{2}}\right].\sin\left(x-1\right)}=\dfrac{3}{4}\left(1-\ln 4\right)$

583) $\lim\limits_{x\to 0}\dfrac{\left(x+1\right)\left(x+2\right)\left(x+3\right)\times\cdots\times\left(x+n\right)-n!}{\left(x+1\right)\left(x+2\right)\left(x+3\right)\times\cdots\times\left(x+p\right)-p!}=\dfrac{n!}{p!}\times\dfrac{1+\dfrac{1}{2}+\dfrac{1}{3}+\cdots+\dfrac{1}{n}}{1+\dfrac{1}{2}+\dfrac{1}{3}+\cdots+\dfrac{1}{p}}$

584) $\lim\limits_{n\to\infty}n^2\sum\limits_{k=1}^{+\infty}\dfrac{1}{k^4-k^2+1}=+\infty$

585) $\lim\limits_{n\to\infty}n.\int\limits_{\frac{n^2}{\sqrt[n]{n!}}}^{\frac{\left(n+1\right)^2}{\sqrt[n+1]{\left(n+1\right)!}}}\dfrac{\sqrt[n]{e^x}}{x}dx=e^e$

586) $\lim\limits_{x\to 2}\left[\dfrac{\Gamma\left(x+2\right)}{x+4}\right]^{\frac{1}{x-2}}=e^{\frac{5}{3}-\gamma}$

587) $\lim\limits_{n\to\infty}\left(\dfrac{\sqrt[n]{k+1}+\sqrt[n]{k+3}}{\sqrt[n]{k+2}+\sqrt[n]{k+4}}\right)^n=\sqrt{\dfrac{\left(k+1\right)\left(k+3\right)}{\left(k+2\right)\left(k+4\right)}}$

588) $\lim\limits_{\varepsilon\to 0^+}\int_{\varepsilon}^{1}\dfrac{x\log x}{1+x^2+x^4}dx=\dfrac{1}{36}\left[\psi^{(1)}\left(\dfrac{2}{3}\right)-\psi^{(1)}\left(\dfrac{1}{3}\right)\right]$

589) $\lim\limits_{n\to\infty} n\left[\dfrac{\log\left(1+\dfrac{\sqrt[n]{e}}{n}\right)^{n+1}}{\log\left(1+\dfrac{\sqrt[n+1]{e}}{n+1}\right)^{n}}-1\right]=2$

590) $\lim\limits_{n\to\infty}\left(\dfrac{\dfrac{A_1}{A_n}+\dfrac{A_2}{A_{n-1}}+\cdots+\dfrac{A_n}{A_1}}{\log A_1+\log A_2+\cdots+\log A_n}\right)^{\log\left(\sqrt[n]{A_1.A_2\times\cdots\times A_n}\right)}$, $A_n=\dfrac{1}{2}\left(\prod\limits_{k=1}^{n}\tan^2\left(\dfrac{k\pi}{2n+1}\right)-1\right)=e^{\gamma-1}$

591) $\lim\limits_{n\to\infty}\dfrac{1}{3^n}\times\sqrt[n]{\dfrac{1}{n!}\prod\limits_{i=1}^{n}\left(\sum\limits_{k=1}^{i}kC_{2i}^{2k}\right)}=0$

592) $\lim\limits_{n\to\infty}\left[\sum\limits_{k=1}^{n}\dfrac{\left(-1\right)^{k+1}}{k}C_n^k-\log n\right]=\gamma$

593) $\lim\limits_{n\to\infty}n^6\sin\left(\dfrac{1}{n^3}\right)\tan\left(\dfrac{1}{n^5}\right).\sum\limits_{1\le k\le l\le n}\sin\left(\dfrac{k+l}{n}\right)=\sin 1.\left(1-\cos 1\right)$

594) $\lim\limits_{x\to\frac{\pi}{2}}\dfrac{\tan\left(\dfrac{x}{2}\right)-1}{x-\dfrac{\pi}{2}}=1$

595) $\lim\limits_{x\to 0}\dfrac{\sin\left(x^2\right)-\sin^2 x}{x^2-\ln\left(1+x^2\right)}=\dfrac{2}{3}$

596) $\lim\limits_{x\to 1}\dfrac{x\left(x+1\right)\left(x+2\right)\left(x+3\right)-4!}{x-1}=50$

597) $\lim\limits_{n\to\infty}\dfrac{1}{n}\displaystyle\int_{2^{n-n^2}}^{3^{n+n^2}}\dfrac{dx}{\sqrt[n]{x^{n+3}}+5.\sqrt[n+1]{x^{n+2+\frac{1}{n}}}+4.\sqrt[n+2]{x^{\frac{n^3+3n^2-4}{n^2+2n}}}}=\dfrac{\pi}{12}$

598) $\lim\limits_{n\to\infty}\left[\dfrac{2n.\displaystyle\int_0^{\log 2}\left(x^2e^x\right)^{(n+1)}dx.\int_0^2\left(\dfrac{x^2}{x-1}\right)^{(n+1)}dx}{\displaystyle\int_0^2\left(\dfrac{x^2+1}{x-1}\right)^{(n+1)}dx.\int_0^{\log 2}\left(x^3e^x\right)^{(n+1)}dx}\right]^n=\dfrac{8}{\sqrt{e^7}}$

, $(*)^{(n)}$ *is n th derivative*

599) $\lim\limits_{x\to\frac{\pi}{4}}\dfrac{\frac{1}{e}-e^{\tan x-2}}{\ln\left(\cot x\right)}=\dfrac{1}{e}$

600) $\lim\limits_{n\to\infty}n^2\left(\displaystyle\int_0^1\dfrac{dx}{x^2+2x\cos\left(\dfrac{\pi}{n}\right)+1}-\lim_{n\to\infty}\int_0^1\dfrac{dx}{x^2+2x\cos\left(\dfrac{\pi}{n}\right)+1}\right)=\dfrac{\pi^2}{24}$

601) $\lim\limits_{n\to+\infty}n!\times\left(e-\displaystyle\sum_{k=0}^{n}\dfrac{1}{k!}\right)=0$

602) $\lim\limits_{x\to\frac{\pi}{2}}\dfrac{4\sqrt{2}\left(\sin 3x+\sin x\right)}{\left(2\sin 2x.\sin\dfrac{3x}{2}+\cos\dfrac{5x}{2}\right)-\left(\sqrt{2}+\sqrt{2}\cos 2x+\cos\dfrac{3x}{2}\right)}=8$

603) $\lim\limits_{x\to\frac{3\pi}{2}}\dfrac{\cos x}{2x-3\pi}=\dfrac{1}{2}$

604) $\lim\limits_{x\to\frac{\pi}{2}}\left(\dfrac{1}{\csc x}\right)^{\sin\left(\frac{1}{\sec x}\right)}=1$

605) $\lim\limits_{x\to\frac{3\pi}{2}}\dfrac{\cos x+3\cos\left(\dfrac{x}{3}\right)}{\left(2x-3\pi\right)^3}=-\dfrac{1}{54}$

606) $\lim\limits_{x\to 0}\dfrac{\sin\left(\tan x\right)-\tan\left(\sin x\right)}{x-\sin x}=0$

607) $\lim\limits_{x\to\frac{\pi}{4}}\dfrac{\sqrt{\tan x+8}-\sqrt{9}}{4x-\pi}=\dfrac{1}{3}$

608) $\lim\limits_{x\to\frac{\pi}{2}}\left(\dfrac{\sec^2 x-2\tan x}{\tan^2 x-4\tan x+2}\right)^{\tan x}=e^2$

609) $\lim\limits_{x\to 0}\dfrac{42^x-21^x-14^x-6^x+7^x+3^x+2^x-1}{x^3}=\ln 2\times\ln 3\times\ln 7$

610) $\lim\limits_{x\to 0}\dfrac{\cos\left(\dfrac{\pi}{2}\cos x\right)}{\sin\left(\sin x\right)}=0$

611) $\lim\limits_{x\to 1}\dfrac{\sqrt{3\sqrt{x}+\sqrt[3]{x}}-2}{x^2-1}=\dfrac{11}{48}$

612) $\lim\limits_{x\to 2}\dfrac{\tan\left(\dfrac{\pi}{2}x\right)}{\sqrt{x}-\sqrt{2}}=\pi\sqrt{2}$

613) $\lim\limits_{x\to 0}\left(\dfrac{4^{|x|}+9^{|x|}}{2}\right)^{\frac{1}{|x|}}=6$

614) $\lim\limits_{x\to \infty}\left(81.\sqrt[x]{5}-80\right)^{x}=5^{81}$

615) $\lim\limits_{x\to 1}\dfrac{x^{11}-x^{6}}{x^{12}-x^{5}}=\dfrac{5}{7}$

616) $\lim\limits_{x\to 1}\dfrac{\sqrt{x^{3}}-\sqrt{x}}{\sqrt{x^{11}}-\sqrt{x}}=\dfrac{1}{5}$

617) $\lim\limits_{x\to -1}\left(\dfrac{x^{4}+x^{2}+x+1}{x^{2}-x+1}\right)^{\frac{1-\cos(x+1)}{(x+1)^{2}}}=\sqrt{\dfrac{2}{3}}$

618) $\lim\limits_{x\to 0}\dfrac{2e^{x}+2x+(x-2)^{2}-(x^{2}+6)}{x^{2}}=1$

619) $\lim\limits_{x\to 0}\dfrac{\sqrt{\cos\sqrt{x}}-1}{x}=-\dfrac{1}{4}$

620) $\lim\limits_{x\to 1}\dfrac{x^{10}-1}{x^{6}-x^{5}+x^{4}-x^{3}+x^{2}-x}=\dfrac{10}{3}$

621) $\lim\limits_{x\to \frac{\pi}{4}}\dfrac{\sin(\sin x-\cos x)}{\cos 2x}=-\dfrac{\sqrt{2}}{2}$

622) $\lim\limits_{x\to 0}\dfrac{5\sin x-7\sin 2x+3\sin 3x}{\tan x-x}=-15$

623) $\lim\limits_{x\to 0}\dfrac{\sqrt{\sec x}+\sqrt{\csc x}}{\sqrt{\tan x}+\sqrt{\cot x}}$

624) $\lim\limits_{n\to\infty}\left(1+\dfrac{1}{n!}\right)^{n}=1$

625) $\lim\limits_{x\to\frac{\pi}{2}}\left(\dfrac{a^{\cot x}+b^{\cot x}+c^{\cot x}+d^{\cot x}}{4}\right)^{\tan x}=\sqrt[4]{abcd}$

626) $\lim\limits_{x\to 0}\left(\dfrac{\tan^{2}x-\sec x.\tan x+\sec^{2}x}{\tan^{2}x+\sec x.\tan x+\sec^{2}x}\right)^{\csc x}=\dfrac{1}{e^{2}}$

627) $\lim\limits_{x\to e}\dfrac{x^{2}-e^{2}}{\ln x-1}=2e^{2}$

628) $\lim\limits_{x\to e}\dfrac{\sin x-\sin e}{\ln x-1}=e\cos e$

629) $\lim\limits_{x\to 3}\dfrac{\sin\left(\dfrac{3\pi}{x}\right)}{x-3}=\dfrac{\pi}{3}$

630) $\lim\limits_{x\to 0}\dfrac{\cot x}{\csc x-1}=1$

631) $\lim\limits_{x\to\frac{\pi}{6}}\dfrac{2\sin^{2}x-1+\sin x}{1-3\sin x+2\sin^{2}x}=-3$

632) $\lim\limits_{x\to 0}\dfrac{\sin 7x-7\sin x}{x^{3}}=-56$

633) $\lim\limits_{x\to\frac{\pi}{2}}\left(\dfrac{\tan^{2}x-\cot^{2}x}{\sec^{2}x+\csc^{2}x}\right)^{\tan^{2}x}=\dfrac{1}{e^{2}}$

634) $\lim\limits_{x\to 0^{+}}\sqrt[x]{\cos\sqrt{x}}=\dfrac{1}{\sqrt{e}}$

635) $\lim\limits_{x\to 0}\dfrac{e^{ax}-e^{-ax}}{e^{\pi x}-e^{-\pi x}}=\dfrac{a}{\pi}$

636) $\lim\limits_{x\to 0}\dfrac{x^{\sin x}}{\left(1-\cos x\right)^{\tan x}}=1$

637) $\lim\limits_{x\to +\infty}x^{2}\left(e^{\frac{1}{x}}-e^{\frac{1}{x-1}}\right)=-1$

638) $\lim\limits_{x\to 0}\dfrac{e^{x}\sin x-x}{x^{2}}=1$

639) $\lim\limits_{x\to 0}\dfrac{\sqrt{2-\sec^{2}x}-\cos x}{x^{3}\sin 2x}=-\dfrac{1}{4}$

640) $\lim\limits_{x\to \frac{\pi}{2}}\left(\dfrac{2\sec^{2}x-3}{2\sec^{2}x-\sec x+1}\right)^{\frac{\sin^{2}x}{\cos x}}=\sqrt{e}$

641) $\lim\limits_{x\to 0}\dfrac{5e^{5x}-e^{4x}-e^{3x}-e^{2x}-e^{x}-1}{x}=15$

642) $\lim\limits_{x\to \frac{\pi}{4}}\dfrac{\sin\left(x+\dfrac{\pi}{4}\right)-1}{x-\dfrac{\pi}{4}}=0$

643) $\lim\limits_{x\to \alpha}\left(\left(\left(\dfrac{\alpha^{\frac{1}{4}}+x^{\frac{1}{4}}}{\alpha^{\frac{1}{8}}-x^{\frac{1}{8}}}\right)^{-1}-\dfrac{2\left(\alpha x\right)^{\frac{1}{8}}}{x^{\frac{3}{8}}-\alpha^{\frac{1}{8}}x^{\frac{1}{4}}+\alpha^{\frac{1}{4}}x^{\frac{1}{8}}-\alpha^{\frac{3}{8}}}\right)^{-1}-\sqrt[8]{8}^{\log_{8}\alpha}\right)^{16}$

644) $\lim\limits_{x\to\pi}\left[\dfrac{\sin x-\ln\left(\dfrac{x}{\pi}\right)+2}{1-\cos x}\right]^{\tan\left(\frac{x}{2}\right)}=e^{\frac{\pi+1}{\pi}}$

645) $\lim\limits_{\lambda\to 0}\left[\int_0^1\left(1+x\right)^{\lambda}dx\right]^{\frac{1}{\lambda}}=\dfrac{4}{e}$

646) $\lim\limits_{x\to\infty}\left[\ln\left(\sin\dfrac{1}{x}\right)+\ln x\right]=0$

647) $\lim\limits_{x\to 1}\dfrac{3x^2-\left(7x+1\right)\sqrt{x}+5}{x-1}=-5$

648) $\lim\limits_{x\to 0}\dfrac{\Gamma\left(ax\right)}{\Gamma\left(x\right)}\ ,\left(a\in\mathbb{R}_+^*\right)\ ,\ \Gamma\ \textit{is Gamma function}\ =\dfrac{1}{a}$

649) $\lim\limits_{x\to\infty}\dfrac{\left(x+5\right)^{10}+\left(x+6\right)^{10}-\left(x+7\right)^{10}}{6x^{10}+10^6}=\dfrac{1}{6}$

650) $\lim\limits_{x\to 1}\dfrac{3\sin\left(\pi x\right)-\sin\left(3\pi x\right)}{\left(x-1\right)^3}=-4\pi^3$

651) $\lim\limits_{x\to\infty}\dfrac{3x^x}{\left(2+x\right)^x}=\dfrac{3}{e^2}$

652) $\lim\limits_{h\to 0}\dfrac{\tan\left(\dfrac{\pi^2}{4\pi+h}\right)-1}{h}=-\dfrac{1}{8}$

653) $\lim\limits_{x\to y}\dfrac{x\sqrt{x}-y\sqrt{y}}{\sqrt{x}-\sqrt{y}}=3y$

654) $\lim\limits_{x\to \pi}\dfrac{1-\cos x\left[\ 7\left(x-\pi\right)\ \right]}{5\left(x-\pi\right)^{2}}=\dfrac{49}{10}$

655) $\lim\limits_{x\to 1}x^{\frac{x}{\sin\left(1-x\right)}}=\dfrac{1}{e}$

656) $\lim\limits_{x\to 1}\dfrac{\sqrt[4]{3-2x}-\sqrt[4]{x}}{1-x^{4}}=\dfrac{3}{16}$

657) $\lim\limits_{x\to 1}\dfrac{x^{2}+x-2}{x^{5}+x^{4}-2}=\dfrac{1}{3}$

658) $\lim\limits_{x\to \frac{\pi}{2}}\left(\dfrac{\sec^{2}x+\tan^{2}x-2}{\sec^{2}x+\tan^{2}x-\sec x+2}\right)^{\frac{\tan^{2}x}{\sec x}}=\sqrt{e}$

659) $\lim\limits_{x\to 0}\dfrac{\cos\left(\dfrac{x}{2}\right)-\sqrt{\cos x+x\sin x}}{x^{2}}=-\dfrac{3}{8}$

660) $\lim\limits_{x\to 0}\dfrac{\tan^{-1}x-\sin^{-1}x}{\tan x-\sin x}=-1$

661) $\lim\limits_{x\to 2}\dfrac{\sqrt{2x-3}\,.\sqrt[3]{3x-5}\,.\sqrt[4]{4x-7}\,.\sqrt[5]{5x-9}-1}{x-2}=4$

662) $\lim\limits_{x\to 0}\dfrac{\sqrt{\dfrac{1+x}{1-x}}\times\sqrt[4]{\dfrac{1+2x}{1-2x}}\times\sqrt[6]{\dfrac{1+3x}{1-3x}}-1}{x}=3$

663) $\lim\limits_{x\to 1}\dfrac{\sqrt[3]{x}-\sqrt{x}}{x-1}=-\dfrac{1}{6}$

664) $\lim\limits_{x\to\infty} x\left[\left(\dfrac{1}{x}+2\right)^5-32\right]=80$

665) $\lim\limits_{x\to\frac{\pi}{4}}\dfrac{\sqrt{2}-\cos x-\sin x}{\left(4x-\pi\right)^2}=\dfrac{\sqrt{2}}{32}$

666) $\lim\limits_{x\to 0}\sqrt[x^3]{1-x+\sin x}=\dfrac{1}{\sqrt[6]{e}}$

667) $\lim\limits_{x\to 0}\left(\dfrac{2}{\cos x+1}\right)^{\frac{2}{1-\cos x}}=e$

668) $\lim\limits_{x\to+\infty}\left[\dfrac{x-\ln\left(\dfrac{1+\sqrt{5}}{2}\right)}{x}\right]^x=\left(\dfrac{1+\sqrt{5}}{2}\right)^2-2$

669) $\lim\limits_{x\to 0}\dfrac{e^{x+\ln a}-e^{-x+\ln a}}{\ln\left(x+1\right)}\ ,\left(a>0\right)=2a$

670) $\lim\limits_{x\to 0}\dfrac{\sin^{-1}x-\sin x}{\left(\sin^{-1}x\right)^3}=\dfrac{1}{3}$

671) $\lim\limits_{x\to 0}\dfrac{\sin 3x+\sin 6x-\sin 9x}{x^3}=81$

672) $\lim\limits_{x\to 0}\left[\ \ln\left(x^2+e\right)\ \right]^{\frac{1}{\cos x-1}}=e^{-\frac{2}{e}}$

673) $\lim\limits_{x\to\frac{\pi}{3}}\dfrac{\tan^3 x-3\tan x}{\cos\left(\dfrac{\pi}{6}+x\right)}=-24$

674) $\lim\limits_{x\to 0}\dfrac{e^{\left(2x^2+ax\right)}.\sin x-e^{\left(x^2+bx\right)}.x}{x^2}=a-b$

675) $\lim\limits_{x\to\infty}\left(\dfrac{x^2+1}{x^2-1}\right)^{\left(x^4-1\right)\sin^2\left(\frac{1}{x}\right)}=e^2$

676) $\lim\limits_{x\to 0}\dfrac{x!+\gamma x-1}{x^2}=\dfrac{\gamma^2}{2}+\dfrac{\pi^2}{12}\ ,\ \gamma\ Euler-Mascheroni\ cons\tan t$

677) $\lim\limits_{x\to 1}\dfrac{Li_3\left(x\right)-\dfrac{1}{2}\displaystyle\int_0^\infty\dfrac{u^2}{e^u-1}du}{x-1}=\dfrac{\pi^2}{6}$

678) $\lim\limits_{x\to 0^+}\displaystyle\int_0^1\dfrac{\ln\left[\ x^{x^2}\sin\left(x\sqrt{t}\right)+x^{x^2}\ \right]}{x}\,dt=\dfrac{2}{3}$

679) $\lim\limits_{n\to\infty}\lim\limits_{x\to 2}\dfrac{\underbrace{\left(\left(\left(x!\right)!\right)!\ldots\right)!}_{n\ times}-2}{\underbrace{\left(\left(\left(x!\right)!\right)!\ldots\right)!}_{\left(n-1\right)\ times}-2}=3-2\gamma$

680) $\lim\limits_{n\to\infty}\dfrac{n^1+n^2+n^3+\cdots+n^n}{1^n+2^n+3^n+\cdots+n^n}=1-\dfrac{1}{e}$

681) $\lim\limits_{n\to\infty}\dfrac{\ln\left(n^n\right)}{\ln\left[\ \left(2n\right)!\ \right]}=\dfrac{1}{2}$

682) $\lim\limits_{x\to 0}\ln\left(\sqrt[x]{x!}\right)=-\gamma$

683) $\lim\limits_{x\to 0}\left[\ \varsigma\left(x\right)-\dfrac{\eta\left(x\right)}{\Gamma\left(x\right)}\ \right]=\dfrac{1}{2}$

ដែល $\varsigma\left(x\right)$ *function zeta* , $\eta\left(x\right)$ *function eta* , $\Gamma\left(x\right)$ *function Gamma*

684) $\lim\limits_{x\to b}\dfrac{\sqrt[x!]{\left(x^{x+b}\right)!}-\sqrt[b!]{\left(b^{b+x}\right)!}}{\left(x^{b!}\right)!-\left(b^{x!}\right)!}$

$$=\frac{b.\sqrt[b!]{\left(b^{2b}\right)!}.\left(\psi^{(0)}\left(b^{2b}+1\right)\left(b^{2b}\right)\left(2+\ln b+b!.\ln b\right)-\psi^{(0)}\left(b+1\right).\ln\left(\left(b^{2b}\right)!\right)\right)}{\left(b!\right)^{2}.\left(b^{b!}\right).\left(b^{b!}\right)!.\left(1-b\ln b.\psi^{(0)}\left(b+1\right)\right)}$$

685) $\lim\limits_{t\to 0}\left[\ \dfrac{n}{1-\left(1+t\right)^{n}}-\dfrac{k}{1-\left(1+t\right)^{k}}\ \right]=\dfrac{n-k}{2}$

686) $\lim\limits_{x\to 1}\dfrac{\sin\left[\ \left(x-1\right)\sin\left(\dfrac{1}{x-1}\right)\ \right]}{\left(x-1\right)\sin\left(\dfrac{1}{x-1}\right)}$

687) $\lim\limits_{x\to 0}\dfrac{\ln\left(1+shx\right)+e^{-x}-1}{x^{3}}=\dfrac{1}{3}$

688) $\lim\limits_{x\to 0}\dfrac{\ln\left(1+e^{x}\right)-\ln\left(2+\dfrac{\sin\left(x^{2}\right)}{4}\right)-\dfrac{x}{2}}{\sin^{2}x.\tan^{2}x}=\dfrac{1}{384}$

689) $\lim\limits_{x\to\infty}\dfrac{\dfrac{\pi}{4}-\arctan\left(1-\dfrac{1}{x}\right)}{\sin\left(\dfrac{1}{x}\right)}=\dfrac{1}{2}$

690) $\lim\limits_{x\to 1}\dfrac{\left[25^{\tan\left(\sqrt[3]{x-1}\right)}-1\right].\left(5^{\sqrt[3]{\tan\left(x-1\right)}}-1\right).\tan\left[\dfrac{\pi\left(x-2\right)}{4}\right]}{\sqrt[6]{\ln\left[1+\tan^{4}\left(x-1\right)\right]}}$

691) $\lim\limits_{x\to\frac{3\pi}{2}}\dfrac{1+\sin x}{\left(3\pi-2x\right)^{2}}$

692) $\lim\limits_{x\to\frac{\pi}{2}}\dfrac{\cos x-\cos 3x}{\cos 5x-\cos 7x}$

693) $\lim\limits_{n\to\infty}\dfrac{\left(-1\right)^{n}}{\sqrt{n}}\sin\left(\dfrac{\pi}{2}\sqrt{n}\right)=0$

694) $\lim\limits_{x\to\frac{\pi}{2}}\dfrac{\ln\left(1+\cos x\right)-\cos^{2}x}{2x-\pi}$

695) $\lim\limits_{x\to -3}\dfrac{\sin\left(\sqrt{x+3}\right)-x-3}{e^{-\sqrt{x+3}}-x-4}$

696) $\lim\limits_{x\to 0}\dfrac{\ln\left[\tan\left(\dfrac{\pi}{4}+ax\right)\right]}{\sin\left(bx\right)}$

697) $\lim\limits_{x\to\infty}x^{2}\left(a^{\frac{1}{x}}+a^{-\frac{1}{x}}-2\right)$

698) $\lim\limits_{n\to\infty}\dfrac{3.n!+n^3}{n!+3^n}=3$

699) $\lim\limits_{x\to 0}\dfrac{\dfrac{\left(\sqrt{\cos 2x+sh2x}-e^x\right)}{x}+\dfrac{2x\left(2-x\right)}{2+x}}{\dfrac{\ln\left(chx\right)}{shx-\dfrac{1}{2}\arcsin x}}$

700) $\lim\limits_{x\to 0}\left(\dfrac{e^{x^2}}{ch3x}\right)^{\frac{1}{x^2}}$

701) $\lim\limits_{x\to 0}\left[\ \ln\left(e+x\right)-\dfrac{x}{e}\ \right]^{\frac{1}{\sin^3 x}}$

702) $\lim\limits_{x\to 0}\left[\ \dfrac{\ln\left(\sqrt{1+x^2}+x\right)}{x}\ \right]^{\frac{1}{x^2}}$

703) $\lim\limits_{x\to 0}\left(\dfrac{\sin x}{\arcsin x}\right)^{\frac{1}{x^2}}$

704) $\lim\limits_{x\to 0}\left[\ \dfrac{\sqrt{1-2x}-\sqrt[3]{1-3x}}{\ln\left(chx\right)}\ \right]^{\frac{1}{x}}$

705) $\lim\limits_{x\to 0}\left(\dfrac{1}{x}e^{\frac{x}{1+x}}-\dfrac{1}{\sin x}\right)^{\frac{1}{\arctan x}}$

706) $\lim\limits_{x\to 0}\left[\dfrac{\tan 3x+\cos 4x-\cos 2x}{\ln\left(\sqrt{1+3x}\right)-\ln\left(\sqrt{1-3x}\right)}\right]^{\frac{1}{\sin x}}$

707) $\lim\limits_{x\to 0}\left(1+6\times\dfrac{x-\sin x}{x^2}\right)^{\frac{2(chx-1)}{x^2}}$

708) $\lim\limits_{x\to 0}\left[\dfrac{e^2-\left(1+2x\right)^{\frac{1}{x}}}{2xe^2}\right]^{\frac{1}{x}}$

709) $\lim\limits_{x\to 0}\left(\dfrac{chx-\cos x}{2\sqrt{1+2x}-2.\sqrt[3]{1+3x}}\right)^{\frac{1}{x}}$

710) $\lim\limits_{x\to 0}\left[\sqrt{1+\tan 2x}+\ln\left(1-x\right)\right]^{\frac{1}{x^2}}$

711) $\lim\limits_{x\to 0}\left(\tan\dfrac{x}{3}+2-\sqrt[3]{1+x}\right)^{\cot^2 x}$

712) $\lim\limits_{x\to 0}\left(e^{\frac{1}{3}\sin x}+\sqrt[3]{1-\tan x}-1\right)^{\frac{1}{\ln\left(1+x^2\right)}}$

713) $\lim\limits_{x\to 0}\left[\dfrac{1}{e}\left(1+x\right)^{\frac{1}{x}}+\dfrac{2x}{4+5x}\right]^{\cot^2 x}$

714) $\lim\limits_{x\to 0}\left(\dfrac{\arctan x}{e^{x}-1-\dfrac{x^{2}}{2}}\right)^{\frac{1}{x^{2}}}$

715) $\lim\limits_{x\to 0}\left[\dfrac{xshx}{\ln\left(1+x^{2}\right)}\right]^{\cot^{2}x}$

716) $\lim\limits_{x\to 0}\left(\dfrac{2\cos x+x}{2\sqrt{1+x}}\right)^{\frac{1}{x^{2}}}$

717) $\lim\limits_{x\to 0}\left(\dfrac{x\sin x}{2chx-2}\right)^{\frac{1}{x^{2}}}$

718) $\lim\limits_{x\to 0}\left(\dfrac{\sqrt{1+x}-\sqrt{1-x}}{shx}\right)^{\frac{1}{\sin^{2}x}}$

719) $\lim\limits_{n\to\infty}\dfrac{\sqrt{\left(n+1\right)^{3}}-\sqrt{n\left(n-1\right)\left(n-3\right)}}{\sqrt{n}}=\dfrac{7}{2}$

720) $\lim\limits_{n\to\infty}\dfrac{\left(2n+1\right)^{2}-\left(n-1\right)^{2}}{\left(2n+1\right)^{2}+\left(n-1\right)^{2}}=\dfrac{3}{5}$

721) $\lim\limits_{x\to 0}\left[\,1-\ln\left(1+\sqrt[3]{x}\right)\,\right]^{\frac{x}{\sin^{4}\left(\sqrt[3]{x}\right)}}$

722) $\lim\limits_{x\to 0}\left[\,\cos\left(\pi x\right)\,\right]^{\frac{1}{x\sin\left(\pi x\right)}}$

723) $\lim\limits_{x\to 0}\left(2-5^{\arcsin\left(x^3\right)}\right)^{\frac{\csc^2 x}{x}}$

724) $\lim\limits_{x\to 0}\left(2-e^{\sin x}\right)^{\cot\left(\pi x\right)}$

725) $\lim\limits_{x\to 0}\left(2-e^{x^2}\right)^{\frac{1}{\ln\left[\,1+\tan^2\left(\frac{\pi x}{3}\right)\right]}}$

726) $\lim\limits_{x\to 0}\left(2-3^{\sin^2 x}\right)^{\frac{1}{\ln\left(\cos x\right)}}$

727) $\lim\limits_{x\to 0}\left(6-\dfrac{5}{\cos x}\right)^{\cot^2 x}$

728) $\lim\limits_{x\to 0}\left(\dfrac{1+\sin x\,.\cos 2x}{1+\sin x\,.\cos 3x}\right)^{\frac{1}{\sin\left(x^3\right)}}$

729) $\lim\limits_{x\to 0}\left[\,1-\ln\left(\cos x\right)\,\right]^{\frac{1}{\tan^2 x}}$

730) $\lim\limits_{x\to 0}\left[\,2-e^{\left(\arcsin\sqrt{x}\right)^2}\,\right]^{\frac{3}{x}}$

731) $\lim\limits_{x\to 0}\left(1-x\sin^2 x\right)^{\frac{1}{\ln\left(1+x^2\pi\right)}}$

732) $\lim\limits_{x\to 0}\left(\dfrac{1+\tan x\,.\cos 2x}{1+\tan x\,.\cos 5x}\right)^{\frac{1}{x^3}}$

733) $\lim\limits_{x\to 0}\left[\,1-\sin^2\left(\frac{x}{2}\right)\right]^{\frac{1}{\ln\left(1+\tan^2 3x\right)}}$

734) $\lim\limits_{n\to\infty}\left[\,\sqrt{\left(n^2+1\right)\left(n^2+2\right)}-\sqrt{\left(n^2-1\right)\left(n^2-2\right)}\,\right]$

735) $\lim\limits_{x\to\pi}\dfrac{\sqrt{1-\tan x}-\sqrt{1+\tan x}}{\sin 2x}$

736) $\lim\limits_{x\to 2}\left[\,\dfrac{\sin\left(3\pi x\right)}{\sin\left(\pi x\right)}\,\right]^{\sin^2\left(x-2\right)}$

737) $\lim\limits_{x\to 3}\left[\,\dfrac{\arcsin\left(x-3\right)}{\sin\left(3\pi x\right)}\,\right]^{x^2-9}$

738) $\lim\limits_{x\to\pi}\left(\cot\dfrac{x}{4}\right)^{\frac{1}{\cot\left(\frac{x}{2}\right)}}$

739) $\lim\limits_{x\to\frac{\pi}{2}}\left(\cot\dfrac{x}{2}\right)^{\frac{1}{\cos x}}$

740) $\lim\limits_{x\to\frac{\pi}{2}}\left(\sin x\right)^{6\tan x\,.\,\tan 3x}$

741) $\lim\limits_{x\to\frac{\pi}{2}}\dfrac{\ln\left(2x\right)-\ln\pi}{\sin\left(\dfrac{5x}{2}\right).\cos x}$

742) $\lim\limits_{x\to-\pi}\dfrac{\sin 4x}{x^2+\pi x}=-\dfrac{4}{\pi}$

743) $\lim\limits_{x\to 1}\dfrac{\cos\left[\left(x+\dfrac{1}{2}\right)\pi\right].\tan\left(\pi x\right)}{\arcsin\left[\left(1-x\right)^2\right]}=\pi^2$

744) $\lim\limits_{x\to 3\pi}\dfrac{2^x-8^{\pi}}{\sin 7x-\sin 3x}=-2^{3\pi-2}.\ln 2$

745) $\lim\limits_{x\to\frac{3}{2}}\left(2-\dfrac{2x}{3}\right)^{\tan\left(\frac{\pi x}{6}\right)}=e^{\frac{2}{\pi}}$

746) $\lim\limits_{x\to\pi}\dfrac{\sin^2 x-\tan^2 x}{\left(x-\pi\right)^4}$

747) $\lim\limits_{n\to\infty}\dfrac{4^n+n^2.2^n-1}{n^4+\left(n!\right)^2}$

748) $\lim\limits_{n\to\infty}\left(\dfrac{7}{10}+\dfrac{29}{100}+\cdots+\dfrac{2^n+5^n}{10^n}\right)$

749) $\lim\limits_{n\to\infty}\dfrac{10^n+n!}{2^n+\left(n+1\right)!}$

750) $\lim\limits_{n\to\infty}\sqrt[n]{\dfrac{1}{2}\times\dfrac{1}{4}\times\cdots\times\dfrac{1}{2n}}$

751) $\lim\limits_{n\to\infty}\dfrac{\left(-3\right)^{n^2-n}}{\left(n^3\right)!}$

752) $\lim\limits_{x\to\frac{\pi}{2}}\dfrac{e^{\tan 2x}-e^{-\sin 2x}}{\sin x-1}$

753) $\lim\limits_{x\to 2}\dfrac{\ln\left(x-\sqrt[3]{2x-3}\right)}{\sin\left(\dfrac{\pi x}{2}\right)-\sin\left[\left(x-1\right)\pi\right]}$

754) $\lim\limits_{x\to \frac{\pi}{2}}\dfrac{e^{\sin 2x}-e^{\tan 2x}}{\ln\left(\dfrac{2x}{\pi}\right)}$

755) $\lim\limits_{x\to a}\dfrac{a^{x^2-a^2}-1}{\tan\left[\ln\left(\dfrac{x}{a}\right)\right]}$

756) $\lim\limits_{x\to \pi a}\dfrac{\ln\left(\cos\dfrac{x}{a}+2\right)}{a^{\frac{a^2\pi^2}{x^2}-\frac{a\pi}{x}}-a^{\frac{a\pi}{x}-1}}$

757) $\lim\limits_{n\to\infty}\dfrac{\ln\left(2^n+x^n\right)}{n}\,,\left(x\geq 0\right)$

758) $\lim\limits_{n\to\infty}\sqrt[n]{1+e^{n\left(x+1\right)}}$

759) $\lim\limits_{n\to\infty}\dfrac{x\tan^{2n}\left(\dfrac{\pi x}{4}\right)+\sqrt{x}}{\tan^{2n}\left(\dfrac{\pi x}{4}\right)+1}\,,\left(x\geq 0\right)$

760) $\lim\limits_{n\to\infty}\left[\dfrac{x^{n+1}}{\left(n+1\right)!}+\dfrac{x^{n+2}}{\left(n+2\right)!}+\cdots+\dfrac{x^{2n}}{\left(2n\right)!}\right]$

761) $\lim\limits_{x\to 0}\dfrac{\sqrt{1+x\sin x-1}}{e^{x^2}-1}$

762) $\lim\limits_{x\to\frac{\pi}{2}} \dfrac{1-\sin^{\alpha+\beta}x}{\sqrt{\left(1-\sin^{\alpha}x\right)\left(1-\sin^{\beta}x\right)}}\ ,\ \left(\alpha,\beta>0\right)$

763) $\lim\limits_{x\to 1} \dfrac{\sin^{2}\left(\pi.2^{x}\right)}{\ln\left[\ \cos\left(\pi.2^{x}\right)\ \right]}$

764) $\lim\limits_{x\to 0} \dfrac{\ln\left(1+x\right).\sin 2x+\cos 2x-\dfrac{1}{1+x^{3}}}{x^{4}}$

765) $\lim\limits_{x\to 0} \dfrac{e^{e^{x}}-e^{\cos x}-e\sin x}{\sqrt{\cos x}-e^{x^{2}}}$

766) $\lim\limits_{x\to\frac{3}{2}} \dfrac{\tan\left(\pi x^{2}\right)-\cot\left(\pi x^{2}\right)}{\sqrt{3}\sin\left(\dfrac{\pi}{x}\right)-x}$

767) $\lim\limits_{x\to\infty}\left(chx-shx\right)$

768) $\lim\limits_{x\to 0} \dfrac{2\left(\tan x-\sin x\right)-x^{3}}{x^{5}}$

769) $\lim\limits_{x\to 0}\left(\dfrac{2+\cos x}{x^{3}\sin x}-\dfrac{3}{x^{4}}\right)$

770) $\lim\limits_{x\to 0} \dfrac{\ln\left(1+x\right)-e\ln\left[\ \ln\left(e+x\right)\ \right]}{x}$

771) $\lim\limits_{x\to 0} \dfrac{e^{x}-\dfrac{x^{3}}{6}-\dfrac{x^{2}}{2}-x-1}{\cos x+\dfrac{x^{2}}{2}-1}$

772) $\lim\limits_{x\to 0}\dfrac{\ln\left[\left(1+x\right)^4\right]-4x+2x^2-\dfrac{4}{3}x^3+x^4}{6\sin x-6x+x^3}$

773) $\lim\limits_{x\to+\infty}\left[\ln\left(x+\ln x\right)-\ln x\right]$

774) $\lim\limits_{x\to+\infty}\left[ch\left(x^{shx}\right)-sh\left(x^{chx}\right)\right]$

775) $\lim\limits_{x\to+\infty}\left[\left(chx\right)^{shx}-\left(shx\right)^{chx}\right]$

776) $\lim\limits_{n\to\infty}\dfrac{n-\lg n}{n^2+\ln^2 n}\left(\sin n+\cos n\right)=0$

777) $\lim\limits_{n\to\infty}\dfrac{2^n+4}{4^n+2}\arcsin\left[\dfrac{\left(-1\right)^{n-1}}{n+3}\right]=0$

778) $\lim\limits_{n\to\infty}\dfrac{\sqrt{n}+3^n}{5^n+\lg\left(\sqrt[6]{n+1}\right)}\arctan\left[4+\left(-1\right)^n n^2\right]=0$

779) $\lim\limits_{n\to\infty}\dfrac{5^n+n^5}{\left(n+1\right)!+2^{n+1}}\sin\left(4+n!\right)=0$

780) $\lim\limits_{x\to 0}\dfrac{2\tan\left(3x\right)-6\tan x}{3\arctan x-\arctan\left(3x\right)}$

781) $\lim\limits_{x\to 0}\dfrac{\tan x-x}{\arcsin x-\ln\left(1+x\right)}$

782) $\lim\limits_{x\to 1}\dfrac{x^{50}-50x+49}{x^{100}-100x+99}$

783) $\lim\limits_{x\to -1}\dfrac{2x^4+3x^3-4x^2-9x-4}{3x^4+5x^3+3x^2+3x+2}$

784) $\lim\limits_{x\to 1}\dfrac{\alpha x^{\alpha+2}-\left(\alpha+1\right)x^{\alpha+1}+x}{\left(x-1\right)^2}$

785) $\lim\limits_{x\to 1}\dfrac{\alpha\left(1-x^{\beta}\right)-\beta\left(1-x^{\alpha}\right)}{\left(1-x^{\alpha}\right)\left(1-x^{\beta}\right)}$, $\alpha\beta\neq 0$

786) $\lim\limits_{x\to 1}\dfrac{\ln x-x+1}{x-x^x}$

787) $\lim\limits_{x\to 0}\dfrac{e^{\sin x}-e^x}{\sin x-x}$

788) $\lim\limits_{x\to 0^+}\dfrac{\ln x}{\ln\left(\sin x\right)}$

789) $\lim\limits_{x\to 0^+}\dfrac{\ln\left(\sin x\right)}{\cot x}$

790) $\lim\limits_{x\to\left(\frac{\pi}{2}\right)^+}\dfrac{\ln\left(x-\dfrac{\pi}{2}\right)}{\tan x}$

791) $\lim\limits_{x\to 0^+}\dfrac{\ln\left(1-\cos x\right)}{\ln\left(\tan x\right)}$

792) $\lim\limits_{x\to +\infty}\dfrac{x^{\alpha}\ln^{\beta}x}{e^{\gamma x}}$

793) $\lim\limits_{x\to+\infty}\dfrac{\sqrt[3]{x}\,.\ln\left(\ln x\right)}{\sqrt[3]{2x+3}\,.\sqrt{\ln x}}$

794) $\lim\limits_{x\to 0}\dfrac{\ln\left(\dfrac{2}{\pi}\arccos x\right)}{\ln\left(1+x\right)}$

795) $\lim\limits_{x\to\frac{\pi}{4}}\dfrac{\ln\left(\tan x\right)}{\cot\left(2x\right)}$

796) $\lim\limits_{x\to\frac{\pi}{2}}\dfrac{\cos\left[\ \left(2m+1\right)x\ \right]}{\cos\left[\ \left(2n+1\right)x\ \right]}\ ,\ \left(m\,,n\right)\in\mathbb{N}^2$

797) $\lim\limits_{x\to 0}\dfrac{\ln\left(\dfrac{1+x}{1-x}\right)-2x}{x-\sin x}$

798) $\lim\limits_{x\to+\infty}\dfrac{e^{\,x}}{x^{\,x^{\alpha}\ln^{\beta}x}}$

799) $\lim\limits_{x\to+\infty}x\ln\left(\dfrac{2}{\pi}\arctan x\right)$

800) $\lim\limits_{x\to+\infty}\left(\pi-2\arctan\sqrt{x}\right).\sqrt{x}$

801) $\lim\limits_{x\to+\infty}x\left[\ \pi-2\arcsin\left(\dfrac{x}{\sqrt{x^{\,2}+1}}\right)\right]$

802) $\lim\limits_{x\to 0^{+}}x^{\alpha}\ln^{\beta}\left(\dfrac{1}{x}\right)\ ,\ \alpha\,,\beta>0$

803) $\lim\limits_{x\to+\infty}x^{a}a^{\,x}\ \ ,\ a>0\ ,a\neq 1$

804) $\lim\limits_{x\to+\infty}\left(x^{\frac{7}{8}}-x^{\frac{6}{7}}\ln^2 x\right)$

805) $\lim\limits_{x\to1}\left(\dfrac{\alpha}{1-x^{\alpha}}-\dfrac{\beta}{1-x^{\beta}}\right),\ \alpha\beta\neq0$

806) $\lim\limits_{x\to+\infty}\left(\dfrac{2}{\pi}\arctan x\right)^{x}$

807) $\lim\limits_{x\to0}\left(\dfrac{2}{\pi}\arccos x\right)^{\frac{1}{x}}$

808) $\lim\limits_{x\to0}\dfrac{ch3x+\cos3x-2}{x^4}$

809) $\lim\limits_{x\to0}\dfrac{1+x\cos x-\sqrt{1+2x}}{\ln\left(1+x\right)-x}$

810) $\lim\limits_{x\to0}\dfrac{3\cos x+\arcsin x-3.\sqrt[3]{1+x}}{\ln\left(1-x^2\right)}$

811) $\lim\limits_{x\to0}\dfrac{\sqrt[3]{1-x^2}-x\cot x}{x\sin x}$

812) $\lim\limits_{x\to0}\dfrac{\cos\left(\dfrac{\pi}{2}\cos x\right)}{\sin\left(\sin^2 x\right)}$

813) $\lim\limits_{x\to0}\dfrac{e^{x}-\sqrt[3]{1+3x+\dfrac{9x^2}{2}}}{x^3}$

814) $\lim\limits_{x\to 0}\dfrac{\ln\left(1+x^3\right)-2\sin x+2x\cos\left(x^2\right)}{\arctan\left(x^3\right)}$

815) $\lim\limits_{x\to 0}\dfrac{x\sqrt{1+\sin x}-\dfrac{1}{2}\ln\left(1+x^2\right)-x}{\tan^3 x}$

816) $\lim\limits_{x\to 0}\dfrac{e^{\sin x}-\sqrt{1+x^2}-x\cos x}{\ln^3\left(1+x\right)}$

817) $\lim\limits_{x\to 0}\dfrac{e^{\sin x.\ln\left(\cos x\right)}-\left(1+4x\right)^{\frac{1}{4}}+x-\dfrac{3x^2}{2}}{x\sin\left(x^2\right)}$

818) $\lim\limits_{x\to 0}\dfrac{e^{\arctan x}+\ln\left(1-x\right)-1}{2-\sqrt{4+x^3}}$

819) $\lim\limits_{x\to 0}\dfrac{\sqrt{1+x}.\sin x+\ln\left(\cos x\right)-x}{\sqrt[3]{1-x^3}-1}$

820) $\lim\limits_{x\to 0}\dfrac{\sqrt{1+x}.shx+\ln\left(\cos x\right)-x}{1-\sqrt[3]{1-x^3}}$

821) $\lim\limits_{x\to 0}\dfrac{\ln\left(e^{2x}+\sin x\right)-3\arcsin x+\dfrac{5x^2}{2}}{\sqrt[3]{8+x^3}-2}$

822) $\lim\limits_{x\to 1}\left(\dfrac{x^{x^{x^{\cdot^{\cdot^{\cdot}}}}}-1}{x-1}\right)^{\frac{1}{\sqrt{x-1}}}=1$

823) $\lim\limits_{x\to 0}\dfrac{\left(x+1\right)^{a}+a^{x}+\ln\left(x+1\right)-2}{\sqrt{x+2}-\sqrt{2}}$

824) $\lim\limits_{x\to 0}\dfrac{\ln\left[\dfrac{1+\ln\left(1+x\right)}{1+x}\right]-\tan\left(x-2x^{2}\right)}{\sqrt{4+x^{3}}-2}$

825) $\lim\limits_{x\to 0}\dfrac{\cos x-\sqrt{1-x^{2}}}{\sin x-x}$

826) $\lim\limits_{x\to 0}\dfrac{\sqrt{1+2x^{3}}-\cos\left(x^{4}\right)}{\tan x-x}$

827) $\lim\limits_{x\to 0}\dfrac{x\sqrt{1+\sin x}+\ln\left(1-x\right)}{\tan x-\sin x}$

828) $\lim\limits_{x\to 0}\dfrac{\sqrt{1-x}\,.\ln\left(1+x\right)-\dfrac{x}{x+1}}{\tan x-\sin x}$

829) $\lim\limits_{x\to 0}\dfrac{e^{\sin x}+\ln\left(1-x\right)-1}{\arcsin x-\sin x}$

830) $\lim\limits_{x\to 0}\dfrac{\sqrt{1+2\tan x}-e^{x}+x^{2}}{\arcsin x-\sin x}$

831) $\lim\limits_{x\to 0}\dfrac{\ln\left(1+x\right).\cos x-e^{\tan x}+\sqrt{1+2x^{2}}}{x-\sin x}$

832) $\lim\limits_{x\to 0}\dfrac{\sqrt{1-\sin x}-\ln\left(1-\dfrac{x}{2}\right)-1}{\tan x-\sin x}$

833) $\lim\limits_{x\to 0}\dfrac{e^{\tan x}-x-chx}{\sin x-\arctan x}$

834) $\lim\limits_{x\to 0}\dfrac{e^{\sin x}+\ln\left(1-\sin x\right)-1}{\tan x-\arctan x}$

835) $\lim\limits_{x\to 0}\dfrac{\sqrt[3]{1+3x}-e^{\sin x}+\dfrac{3x^{2}}{2}}{\arcsin x-\tan x}$

836) $\lim\limits_{x\to 0}\dfrac{\sqrt[3]{1+3x}\,.\ln\left(1-x\right)+\sin\left(\sin x\right)+\dfrac{3x^{2}}{2}}{\tan x-\arcsin x}$

837) $\lim\limits_{x\to 0}\dfrac{e^{\tan x}-\sqrt{1+2x}-x\left(x+x^{2}\right)}{x-\arctan x}$

838) $\lim\limits_{x\to 0}\dfrac{\ln\left(1+\dfrac{x}{2}\right)-\sqrt{1+\sin x}+1}{shx-\arctan x}$

839) $\lim\limits_{x\to 0}\dfrac{e^{\tan\left(\frac{x}{2}\right)}-\sqrt{1+\sin x}-\dfrac{x^{2}}{4}}{\arccos x-\arctan x}$

840) $\lim\limits_{x\to 0}\dfrac{\sqrt[3]{1+3x+x^{2}}+\sin\left[\ \ln\left(1-x\right)\ \right]-e^{-\frac{7x^{2}}{6}}}{x-\arctan x}$

841) $\lim\limits_{x\to 0}\dfrac{\sqrt{1+sh2x}-\cos x-x}{\tan x-\arctan\left(\sin x\right)}$

842) $\lim\limits_{x\to 0}\dfrac{\sqrt{2-e^{2x}}-\cos 2x+\ln\left(1+x\right)}{\sin x-\arcsin\left(\tan x\right)}$

843) $\lim\limits_{x\to 0}\dfrac{xe^{\tan x}-\sin^2 x-x}{x+x^3-\tan x}$

844) $\lim\limits_{x\to 0}\dfrac{\sqrt[3]{1+x^3}-x\cot x-\dfrac{x^2}{3}}{x\cos x-\sin x}$

845) $\lim\limits_{x\to 0}\dfrac{\cos x-\sqrt{1-2x}-x}{x^2\tan x-e^{-x^3}+1}$

846) $\lim\limits_{x\to 0}\dfrac{\sin x-\ln\left(\sin x+\sqrt{1+x^2}\right)}{\tan x-x\cos^2 x}$

847) $\lim\limits_{x\to 0}\dfrac{e^{e^x-1}-\dfrac{1}{1-x}}{\ln\left(\dfrac{1+x}{1-x}\right)-2\sin x}$

848) $\lim\limits_{x\to 0}\dfrac{\tan\left(\sin x\right)-\ln\left(x+\sqrt[3]{1+x^2}\right)-\dfrac{x^2}{6}}{th\left(x-x^3\right)-x}$

849) $\lim\limits_{x\to 0}$

850) $\lim\limits_{x\to 0}\dfrac{e^{2x}-ch2x-2x}{\tan 2x-2\sin x}$

851) $\lim\limits_{x\to 0}\dfrac{\ln\left(1+x-\dfrac{x^2}{6}\right)-shx+\dfrac{2x^2}{3}}{\sin 2x-2x\cos x}$

852) $\lim\limits_{x\to 0}\dfrac{x^2e^{2x}+\ln\left(1-x^2\right)}{x\cos x-\sin x}$

853) $\lim\limits_{x\to 0}\dfrac{\arcsin x+3\cos x-3.\sqrt[3]{1+x}}{1+\ln\left(1+x\right)-e^{x}}$

854) $\lim\limits_{x\to 0}\dfrac{x^{2}e^{x}-\ln\left(1+x^{2}\right)-\arcsin\left(x^{3}\right)}{x\sin x-x^{2}}$

855) $\lim\limits_{x\to 0}\dfrac{e^{1+\tan x}-e^{\sqrt{1+2x}}}{\sin\left(\dfrac{x^{2}}{7}\right)-\dfrac{x}{3}\ln\left(1-x\right)}$

856) $\lim\limits_{x\to 0}\dfrac{e^{x}-\sqrt{1+2x+2x^{2}}}{x+\tan x-\sin 2x}$

857) $\lim\limits_{x\to 0}\dfrac{\tan\left(\sin x\right)-x\cos x}{e^{x}+\ln\left(1-x\right)-1}$

858) $\lim\limits_{x\to 0}\dfrac{e^{x}-x\sqrt{1+x}-1}{\sin x\,.chx-shx}$

859) $\lim\limits_{x\to 0}\dfrac{\tan x-\ln\left(x+\sqrt{1+x^{2}}\right)}{\sin x-x\cos x}$

860) $\lim\limits_{x\to 0}\dfrac{e^{x-x^{2}}-\ln\left(1+\sin x\right)-1}{x\cos x-shx}$

861) $\lim\limits_{x\to 0}\dfrac{2\ln\left(\cos x\right)+xshx}{\sin\left(\dfrac{x^{2}}{2}\right)-sh\left(\dfrac{x^{2}}{2}\right)}$

862) $\lim\limits_{x\to 0}\dfrac{e^{x^{2}}.\tan x-x\cos\left(\sin x\right)}{\ln\left(1+x\right)-x\sqrt{1-x}}$

863) $\lim\limits_{x\to 0}\dfrac{\arcsin x - xe^{x}}{x\sqrt{1-x^{2}} - \tan x}$

864) $\lim\limits_{x\to 0}\dfrac{\sqrt{1-2x} + e^{\tan x} - 2}{\dfrac{\sin x}{x} - \cos x - \dfrac{x^{2}}{3}}$

865) $\lim\limits_{x\to 0}\dfrac{\sqrt{\cos x - x\ln\left(1+x\right)} + \dfrac{3}{4}\tan\left(x^{2}\right) - 1}{xe^{x} - \arcsin x - x^{2}}$

866) $\lim\limits_{x\to 0}\dfrac{sh2x + \ln\left(1-\sin x\right) - \sin\left[\ \ln\left(1+x\right)\ \right]}{\left(1-2x\right)^{-\frac{1}{2}} - e^{x} - x^{2}}$

867) $\lim\limits_{x\to 0}\dfrac{\left(1-2x\right)^{-\frac{1}{2}} - \left(1+2x\right)^{-\frac{1}{2}} - \arctan 2x}{e^{-x} + \ln\left(1+\arcsin x\right) - 1}$

868) $\lim\limits_{x\to 0}\dfrac{\ln\left[\ e^{\sin x} + \ln\left(1-x\right) + \dfrac{x^{3}}{3}\ \right]}{\ln\left(chx\right) - \dfrac{x^{2}}{2}}$

869) $\lim\limits_{x\to 0}\dfrac{\sin\left(\arctan x\right) - \tan x}{e^{shx} - \left(1+2x\right)^{\frac{1}{2}} - x^{2}}$

870) $\lim\limits_{x\to 0}\dfrac{\sqrt[3]{1+x^{2}} - e^{\frac{x^{3}}{4}}}{\ln\left(1+3x^{2}\right) - 3x^{2}\cos x}$

871) $\lim\limits_{x\to 0}\dfrac{\ln\left(\sqrt{1+x^2}-x\right)+\tan x}{x\left(chx-e^{x^2}\right)}$

872) $\lim\limits_{x\to 0}\dfrac{\sqrt[3]{\ln\left(e+x\right)}-e^{\frac{x}{3e}}+\dfrac{x^2}{3e^2}}{xchx-\sin x}$

873) $\lim\limits_{x\to 0}\dfrac{e^{\sin x}-\sqrt{1+x^2}-\arcsin x}{sh\left(x-x^2\right)-\ln\left(\sqrt{1+2x}\right)}$

874) $\lim\limits_{x\to 0}\dfrac{ch\left(\dfrac{2x}{2+x^4}\right)+\cos\left(\dfrac{2x}{2-x^4}\right)-2e^{\frac{x^4}{2}}}{\tan\sqrt{1+x^4}-\tan\sqrt{1-x^4}}$

875) $\lim\limits_{x\to 0}\dfrac{e^{1+\cos x}-e^{2+x^2}+\dfrac{3e^2}{2}\sin\left(x^2\right)}{\ln\left(1+x^2\right)-\left(\arctan x\right)^2}$

876) $\lim\limits_{x\to 0}\dfrac{\ln\left(1+\sin 2x\right)-2x+2x^2}{\dfrac{x}{2}+\tan\left(\dfrac{x}{2}\right)-\arcsin x}$

877) $\lim\limits_{x\to 0}\dfrac{\sqrt{1+\sin x}-\dfrac{1}{2}\tan x+\dfrac{x^2}{8}-1}{e^x-\sqrt{1+2x}-x^2}$

878) $\lim\limits_{x\to 0}\dfrac{\sqrt{1+2x}-e^{\tan x}+6x^3+x^2}{\ln\left(1+x\right)-\arctan x+\dfrac{x^2}{2}}$

879) $\lim\limits_{x\to 0}\dfrac{ch2x-\left(1+3x\right)^{-\frac{1}{3}}-x}{\dfrac{x^{2}}{2}+\ln\left(1+\tan x\right)-\arcsin x}$

880) $\lim\limits_{x\to 0}\dfrac{e^{\frac{x}{1-x}}-shx-\cos x}{\sqrt[6]{1+x}-\sqrt[6]{1-x}-2}$

881) $\lim\limits_{x\to 0}\dfrac{x+chx-e^{\arcsin x}}{\tan x+\sqrt[3]{1-3x}-2\cos x+1}$

882) $\lim\limits_{n\to+\infty}\dfrac{n^{x}}{xC_{n+x}^{n}}=\left(x-1\right)!$

883) $\lim\limits_{n\to+\infty}\dfrac{\sqrt[n]{\left(ax\right)^{1+2x}}+\sqrt[n]{\left(ax\right)^{1-x}}}{\sqrt[n]{\left(ax\right)^{1+2x}}-\sqrt[n]{\left(ax\right)^{1-x}}}=1$

884) $\lim\limits_{x\to\infty}\sqrt[3]{\dfrac{\left(6x\right)!}{x^{6x}}+\dfrac{\left(6x-3\right)!}{\left(x-1\right)^{6x-3}}}=6e^{2}$

885) $\lim\limits_{x\to 0^{+}}\dfrac{\tan x.\sqrt{\tan x}-\sin x.\sqrt{\sin x}}{x^{3}.\sqrt{x}}=\dfrac{3}{4}$

886) $\lim\limits_{x\to+\infty}\dfrac{x^{\frac{x+1}{x}}-x}{\ln x}=1$

887) $\lim\limits_{x\to 4}\dfrac{16\sqrt{x-\sqrt{x}}-3x\sqrt{2}-4\sqrt{2}}{16\left(x-4\right)^{2}}$

888) $\lim\limits_{x\to\frac{\pi}{2}} \dfrac{\sqrt[3]{\sin x}-\sqrt[4]{\sin x}}{x-\dfrac{\pi}{2}}$

889) $\lim\limits_{x\to+\infty}\left(\sin x.e^{x}+e^{x^{2}}\right)$

890) $\lim\limits_{x\to 0} \dfrac{\left|\sin^{7}x-x^{5}\cos^{10}x+x^{3}+1\right|-1}{x\sin^{2}x}$

891) $\lim\limits_{x\to 0} \dfrac{\left|\sin x-x\cos x+1\right|-1}{x}$

892) $\lim\limits_{x\to+\infty}\left[\dfrac{\pi}{2}\sqrt{x+\sqrt{x}}-\sqrt{x}\arctan\left(\dfrac{x}{1+\sqrt{x}}\right)\right]$

893) $\lim\limits_{x\to 2^{+}} \dfrac{\dfrac{\pi}{4}+\arctan\left(\sqrt[3]{\dfrac{x-2}{x-1}}-1\right)}{x-2}$

894) $\lim\limits_{n\to\infty}\sqrt[n]{\sum\limits_{m=1}^{n}\left(\left(1+\dfrac{1}{m}\right)\sum\limits_{p=1}^{n}p!\times\left(1+p^{2}\right)\right)}=\infty$

895) $\lim\limits_{x\to 0} \dfrac{1-\tan\left(\dfrac{\pi}{4}+x\right).\tan\left(\dfrac{\pi}{4}+2x\right).\tan\left(\dfrac{\pi}{4}-3x\right)}{x^{3}}$

896) $\lim\limits_{x\to+\infty}\left(\sqrt{\dfrac{x^{2n+1}}{x-1}}-2x\right),\ n\in\mathbb{N}^{*}$

897) $\lim\limits_{x\to 2} \dfrac{x^{2n}-4^{n}}{x^{2}-3x+2},\ n\in\mathbb{N}^{*}$

898) $\lim\limits_{x\to a^2}\dfrac{\sqrt{x}+x-a-a^2}{x\sqrt{x}+x\sqrt{a}-a^2.\sqrt{x}-a^2.\sqrt{a}}$, $a\in\mathbb{R}_+^*$

899) $\lim\limits_{x\to a}\dfrac{x}{\left|x+a\right|+\left|x-a\right|-\left|x-2a\right|}$, $a\in\mathbb{R}^*$

900) $\lim\limits_{x\to a}\dfrac{x-a}{\sqrt{x}+a\sqrt{x+a}-\left(1+a\sqrt{2}\right)\sqrt{2a-x}}$, $a\in\mathbb{R}_+^*$

901) $\lim\limits_{x\to 1}\dfrac{x-1}{\left|x+\alpha\right|+\left|x-\alpha\right|-\left|x-2\alpha\right|}$, $\alpha\in\mathbb{R}$

902) $\lim\limits_{x\to 0}\dfrac{\tan x-\dfrac{x}{1+x^2}}{\arcsin x-x}$

903) $\lim\limits_{x\to 0}\dfrac{\cos x-e^{x^2}}{\sqrt{1+x^2}-1}$

904) $\lim\limits_{x\to 0}\dfrac{ch\left(\dfrac{2x}{2+x^2}\right)+4\ln\left(\sqrt[4]{\cos x}\right)-1}{e^{-\frac{x^2}{2}}-\sqrt{1-x^2}}$

905) $\lim\limits_{x\to 1}\left(\sqrt{x}-\dfrac{1}{2}\ln x\right)^{\frac{1}{\cos^2 x.\sin^2(1-x)}}$

906) $\lim\limits_{x\to 2}\left(\sqrt{3-x}+\ln\dfrac{x}{2}\right)^{\frac{1}{\sin^2(x-2)}}$

907) $\lim\limits_{x\to 0}\dfrac{\ln\left(\sqrt{1+x^2}-x\right)+\tan x}{x\left(chx-e^{x^2}\right)}$

908) $\lim\limits_{x\to 0}\dfrac{e^{\tan x}-x-chx}{\sin x-\arctan x}$

909) $\lim\limits_{x\to 0}\dfrac{\arcsin x\left(xe^{x}\right)-x.\sqrt[3]{1+3x}}{\ln\left(1+\sin 2x\right)-2sh\left(x-x^{2}\right)}$

910) $\lim\limits_{x\to 0}\left[\dfrac{x\arcsin x}{\ln\left(1+x^{2}\right)}\right]^{\cot^{2}x}$

911) $\lim\limits_{x\to 0}\dfrac{e^{2\sin x+x^{2}}-\sqrt{1+4x}-5x^{2}}{sh2x-\ln\left(\dfrac{1+x}{1-x}\right)}$

912) $\lim\limits_{x\to 0}\dfrac{\sqrt[3]{3x+ch2x}-\dfrac{\arctan x}{x}-x}{\tan x.e^{-\frac{x}{2}}-\ln\left(1+x\right)}$

913) $\lim\limits_{x\to 0}\left(\dfrac{shx}{chx-\cos x+x}+\arcsin x\right)^{\frac{1}{1-\cos x}}$

914) $\lim\limits_{x\to 0}\left[1+\sin\left(e^{x}-1\right)+\ln\left(1-x\right)\right]^{\frac{sh^{2}x}{x^{5}}}$

915) $\lim\limits_{x\to 0}\dfrac{e^{\frac{x}{\sin x}}-\left(1+2x\right)^{\frac{1}{2x}}-ex.\sqrt[3]{1-5x}+\dfrac{2e}{9}x^{3}}{\tan\left(shx\right)-x}$

916) $\lim\limits_{x\to 0}\dfrac{e^{\frac{x^{2}}{2}}.\arcsin x-\sqrt[3]{\cos 3x}.shx}{\ln\left(\dfrac{1+\arctan x}{1-\arctan x}\right)-2x\cos x}$

917) $\lim\limits_{x\to 0}\dfrac{\ln\left(\sqrt{chx}\right)-\tan^2\left(\dfrac{1}{2}shx\right)}{e^{\sqrt{1+x^2}-1}-chx}$

918) $\lim\limits_{x\to 0}\left[\dfrac{\left(1+x^2\right)^x-\left(1-x^2\right)^{-2}+\dfrac{2}{3}x^3}{\left(\tan x-\arctan x\right).\ln\left(e+x\right)}\right]^{\frac{1}{x}}$

919) $\lim\limits_{x\to 0}\dfrac{\arccos\left(\dfrac{\sqrt{3}}{2}+\dfrac{x}{4}\right)-\arctan\left(\sqrt{3}+2x\right)}{\left[\ ch\left(x\sqrt{3}\right)\ \right]^{\cot x}-\left(1+\tan 2x\right)^{\frac{3}{4}}}$

920) $\lim\limits_{x\to 0}\left[\dfrac{\tan x-\sqrt[3]{x^3-x^5}}{\sin x+shx}-\dfrac{2}{x^2}\ln\left(\cos x\right)\right]^{\frac{1}{x^2}}$

921) $\lim\limits_{x\to 0^+}\left(\dfrac{x}{\sin x}-\dfrac{shx}{x}+\dfrac{\sin^4 x}{10}\right)^{\frac{1}{\ln\left(\tan x\right)}}$

922) $\lim\limits_{x\to 0}\left(\ \left(1-sh\left(x^2-x\right)\right)^{-1}\times\dfrac{1}{\cos x}+\tan x\ \right)^{\frac{3}{x-\ln\left(1+x+x^2\right)}}$

923) $\lim\limits_{x\to 0}\dfrac{\pi+sh2x-4\arctan\left(e^x\right)}{\tan x-\sin x}$

924) $\lim\limits_{x\to 0}\dfrac{x+2\ln\left[\dfrac{\ln\left(1+x\right)}{x}\right]}{\pi-2\arcsin\left(1-2x^4\right)}$

925) $\lim\limits_{x\to+\infty} e^{-\frac{x^2}{3}}.\left[\frac{x}{4}\ln\left(\frac{x+2}{x-2}\right)\right]^{x^4}$

926) $\lim\limits_{x\to+\infty} e^{-\frac{x^2}{2}}.\left(\frac{\sqrt{x^2+2x}-\sqrt{x^2-2x}}{2}\right)^{x^4}$

927) $\lim\limits_{x\to+\infty}\left(\ln\left(\tan^2\left(\ln\left(\frac{x+1}{x}-sh^2\left(\frac{1}{x}\right)+\frac{1}{x^3}\right)\right)\right)+4\ln x\right)$

928) $\lim\limits_{x\to0^+}\left[4\ln x-\ln\left(x\cot x-\sqrt[3]{1-sh^2x}\right)\right]$

929) $\lim\limits_{x\to0^+}\left[3\ln x-\ln\left(\frac{1}{x}-\frac{1}{3}\sin 2x-\frac{\cos x}{shx}\right)\right]$

930) $\lim\limits_{x\to0^+} x^{\alpha}.\ln^{\beta}\left(\frac{1}{x}\right),\alpha,\beta>0$

931) $\lim\limits_{n\to\infty}\frac{(-1)^n+\frac{1}{n}}{\frac{1}{n^2}-(-1)^n}$

932) $\lim\limits_{n\to\infty}\frac{a^n}{(1+a)\left(1+a^2\right)\times\cdots\times\left(1+a^n\right)},a>0$

933) $\lim\limits_{n\to\infty} n^2\left[\left(1+\frac{p}{n}\right)^q-\left(1+\frac{q}{n}\right)^p\right],\ p,q\in\mathbb{N}$

934) $\lim\limits_{n\to\infty}\left[\left(n+1\right)^{\alpha}-n^{\alpha}\right]=\begin{cases}0 & if\ \ 0<\alpha<1\\ +\infty & if\ \ \alpha>1\end{cases}$

935) $\lim\limits_{n\to\infty}\dfrac{\left(2n-1\right)!!}{\left(2n\right)!!}$

936) $\lim\limits_{n\to\infty}\dfrac{\ln\left(n!\right)}{n}=+\infty$

937) $\lim\limits_{x\to\infty}\left(\dfrac{e^{x}+e^{-x}}{e^{x}-e^{-x}}\right)^{e^{2x}}$

938) $\lim\limits_{x\to 0^{+}}\left(\dfrac{e^{x}+e^{-x}}{e^{x}-e^{-x}}\right)^{e^{2x}}$

939) $\lim\limits_{n\to\infty}\sqrt{n!}=+\infty$

940) $\lim\limits_{n\to\infty}\sqrt[n]{n!}=+\infty$

941) $\lim\limits_{n\to\infty}\left(1+\dfrac{1}{2^{n}}\right)^{n!}=+\infty$

942) $\lim\limits_{n\to\infty}\dfrac{\sqrt[p]{n}}{\sqrt[n]{n!}}$

943) $\lim\limits_{n\to\infty}\left[\dfrac{1}{n^{p}}\left(1^{p}+2^{p}+3^{p}+\cdots+n^{p}\right)-\dfrac{n}{p+1}\right]\ ,\ p\in\mathbb{N}$

944) $\lim\limits_{n\to\infty}C_{n}^{\alpha}\ ,\alpha\in\mathbb{R}$

945) $\lim\limits_{n\to\infty}n\left[\left(n+1\right)^{\alpha}-n^{\alpha}\right]=+\infty\ \ ,\ \ \alpha>0$

946) $\lim\limits_{x\to 1}\dfrac{x^{n+1}-x^{k+1}+x^{k}-nx+n-1}{\left(x-1\right)^{2}}$, $n,k\in\mathbb{N}$

947) $\lim\limits_{x\to 1}\dfrac{\left(x^{n}-1\right)\left(x^{n-1}-1\right)\times\cdots\times\left(x^{n-k+1}-1\right)}{\left(x-1\right)\left(x^{2}-1\right)\times\cdots\times\left(x^{k}-1\right)}$, $n,k\in\mathbb{N}$, $k\leq n$

948) $\lim\limits_{x\to\frac{\pi}{6}}\dfrac{\cos\left(\dfrac{2\pi}{3}-x\right)}{\sqrt{3}-2\cos x}$

949) $\lim\limits_{x\to 0}\dfrac{4\sin\left(\dfrac{\pi}{6}+x\right).\sin\left(\dfrac{\pi}{6}+2x\right)-1}{\sin x}$

950) $\lim\limits_{n\to\infty}\dfrac{x+e^{nx}}{1+xe^{nx}}$

951) $\lim\limits_{x\to 0}\left(\dfrac{xe^{x}+1}{x\pi^{x}+1}\right)^{\frac{1}{x^{2}}}$

952) $\lim\limits_{x\to 0}\left[\ \ln\left(e+x\right)\ \right]^{\cot x}$

953) $\lim\limits_{x\to\frac{\pi}{2}}\dfrac{\cos\left[\ \left(2m+1\right)x\ \right]}{\cos\left[\ \left(2n+1\right)x\ \right]}$, $m,n\in\mathbb{N}$

954) $\lim\limits_{x\to 1}\dfrac{\alpha x^{\alpha+2}-\left(\alpha+1\right)x^{\alpha+1}+x}{\left(x-1\right)^{2}}$

955) $\lim\limits_{x\to+\infty}\dfrac{x^{\alpha}\ln^{\beta}x}{e^{\gamma x}}$

956) $\lim\limits_{x\to+\infty}\dfrac{e^{x}}{x^{x^{\alpha}\ln^{\beta}x}}$

957) $\lim\limits_{x\to+\infty}x\left[\left(1+\dfrac{a}{x}\right)^{1+\frac{1}{x}}-x^{-\frac{1}{x(x+a)}}\right]$

958) $\lim\limits_{x\to0}\dfrac{\sqrt{1+2\tan x}-e^{x}+x^{2}}{\arcsin x-\sin x}=2$

959) $\lim\limits_{x\to0}\dfrac{e^{\arctan x}-\dfrac{1}{1-x}+\dfrac{x^{2}}{2}}{\ln\left(\dfrac{1+x}{1-x}\right)-2x}=-\dfrac{7}{4}$

960) $\lim\limits_{x\to0}\dfrac{\cos\left[sh\left(\dfrac{x}{\sqrt{5}}\right)\right]-\sqrt[5]{1-\dfrac{x^{2}}{2}}}{ch\left(\sin x\right)-e^{\frac{x^{2}}{2}}}=-\dfrac{3}{50}$

961) $\lim\limits_{x\to0}\dfrac{\ln\left(x+\sqrt{1+x^{2}}\right)-x+\dfrac{1}{6}x^{3}}{x-thx}$

962) $\lim\limits_{x\to0}\left[\cos\left(xe^{x}\right)-\ln\left(1-x\right)-x\right]^{\cot\left(x^{3}\right)}=e^{-\frac{2}{3}}$

963) $\lim\limits_{x\to0}\left[\cos\left(\sin x\right)+\dfrac{1}{2}\left(\arcsin x\right)^{2}\right]^{\frac{1}{x^{2}\left(\sqrt{1+2x}-1\right)}}=1$

964) $\lim\limits_{x\to2}\left[\sqrt{3-x}+\ln\left(\dfrac{x}{2}\right)\right]^{\frac{1}{\sin^{2}\left(x-2\right)}}=e^{-\frac{1}{4}}$

965) $\lim\limits_{x\to+\infty} x^{\frac{7}{4}}\left(\sqrt[4]{x+1}+\sqrt[4]{x-1}-2.\sqrt[4]{x}\right)=-\dfrac{3}{16}$

966) $\lim\limits_{x\to 0}\left(\dfrac{1}{\sin x.\arctan x}-\dfrac{1}{\tan x.\arcsin x}\right)=1$

967) $\lim\limits_{x\to 0}\dfrac{\sqrt[5]{1+2x}-1}{\sqrt[4]{1+x}-\sqrt{1-x}}$

968) $\lim\limits_{x\to 0}\dfrac{sh2x-2shx}{x^3}$

969) $\lim\limits_{x\to 0}\dfrac{ch3x+\cos 3x-2}{x^4}$

970) $\lim\limits_{x\to 0}\dfrac{\cos-1+\dfrac{x^2}{2}}{x^4}$

971) $\lim\limits_{x\to 0}\dfrac{\sqrt{1+x}+\sqrt[3]{1+x}-2.\sqrt[4]{1-x}}{x}$

972) $\lim\limits_{x\to 0}\dfrac{2\arcsin x-\arcsin 2x}{x^3}$

973) $\lim\limits_{x\to 0}\dfrac{1+x\cos x-\sqrt{1+2x}}{\ln\left(1+x\right)-x}$

974) $\lim\limits_{x\to 0}\dfrac{3\cos x+\arcsin x-3.\sqrt[3]{1+x}}{\ln\left(1-x^2\right)}$

975) $\lim\limits_{x\to 0}\dfrac{\sqrt[3]{1-x^2}-x\cot x}{x\sin x}$

976) $\lim\limits_{x\to 0}\dfrac{\left(1+x\right)^{x}-1}{x^{2}}$

977) $\lim\limits_{x\to 0}\dfrac{e^{x}-\sqrt[3]{1+3x+\dfrac{9}{2}x^{2}}}{x^{3}}$

978) $\lim\limits_{x\to 0}\dfrac{\ln\left(1+x^{3}\right)-2\sin x+2x\cos\left(x^{2}\right)}{\arctan\left(x^{3}\right)}$

979) $\lim\limits_{x\to 0}\dfrac{x\sqrt{1+\sin x}-\dfrac{1}{2}\ln\left(1+x^{2}\right)-x}{\tan^{3}x}$

980) $\lim\limits_{x\to 0}\dfrac{e^{\sin x}-\sqrt{1+x^{2}}-x\cos x}{\ln^{3}\left(1-x\right)}$

981) $\lim\limits_{x\to 0}\dfrac{e^{\sin x.\ln\left(\cos x\right)}-\left(1+4x\right)^{\frac{1}{4}}+x-\dfrac{3}{2}x^{2}}{x\sin\left(x^{2}\right)}$

982) $\lim\limits_{x\to 0}\dfrac{e^{\arctan x}+\ln\left(1-x\right)-1}{2-\sqrt{4+x^{3}}}$

983) $\lim\limits_{x\to 0}\dfrac{\sqrt{1+x}.\sin x+\ln\left(\cos x\right)-x}{\sqrt[3]{1-x^{3}}-1}$

984) $\lim\limits_{x\to 0}\dfrac{\sqrt{1+x}.shx+\ln\left(\cos x\right)-x}{1-\sqrt[3]{1-x^{3}}}$

985) $\lim\limits_{x\to 0}\dfrac{\ln\left(e^{2x}+\sin x\right)-3\arcsin x+\dfrac{5}{2}x^{2}}{\sqrt[3]{8+x^{3}}-2}$

986) $\lim\limits_{x\to 0}\dfrac{\ln\left[1+\dfrac{\ln(1+x)}{1+x}\right]-\tan\left(x-2x^2\right)}{\sqrt{4+x^3}-2}$

987) $\lim\limits_{x\to 0}\dfrac{\cos x-\sqrt{1-x^2}}{\sin x-x}$

988) $\lim\limits_{x\to 0}\dfrac{\sqrt{1+2x^2}-\cos\left(x^4\right)}{\tan x-x}$

989) $\lim\limits_{x\to 0}\dfrac{x\sqrt{1+\sin x}+\ln(1-x)}{\tan x-\sin x}$

990) $\lim\limits_{x\to 0}\dfrac{\sqrt{1-x}\,.\ln(1+x)-\dfrac{x}{x+1}}{\tan x-\sin x}$

991) $\lim\limits_{x\to 0}\dfrac{e^{\sin x}+\ln(1-x)-1}{\arcsin x-\sin x}$

992) $\lim\limits_{x\to 0}\dfrac{\sqrt{1+2\tan x}-e^{x}+x^2}{\arcsin x-\sin x}$

993) $\lim\limits_{x\to 0}\dfrac{\ln(1+x).\cos x-e^{\tan x}+\sqrt{1+2x^2}}{x-\sin x}$

994) $\lim\limits_{x\to 0}\dfrac{\sqrt{1-\sin x}-\ln\left(1-\dfrac{x}{2}\right)-1}{\tan x-\sin x}$

995) $\lim\limits_{x\to 0}\dfrac{e^{\tan x}-x-chx}{\sin x-\arctan x}$

996) $\lim\limits_{x\to 0}\dfrac{e^{\sin x}+\ln\left(1-\sin x\right)-1}{\tan x-\arctan x}$

997) $\lim\limits_{x\to 0}\dfrac{\sqrt[3]{1+3x}-e^{\sin x}+\dfrac{3}{2}x^{2}}{\arcsin x-\tan x}$

998) $\lim\limits_{x\to 0}\dfrac{\sqrt[3]{1+3x}\,.\ln\left(1-x\right)+\sin\left(\sin x\right)+\dfrac{3}{2}x^{2}}{\tan x-\arcsin x}$

999) $\lim\limits_{x\to 0}\dfrac{e^{\tan x}-\sqrt{1+2x}-x\left(x+x^{2}\right)}{x-\arctan x}$

1000) $\lim\limits_{x\to 0}\dfrac{\ln\left(1+\dfrac{x}{2}\right)-\sqrt{1+\sin x}+1}{shx-\arctan x}$

1001) $\lim\limits_{x\to 0}\dfrac{e^{\tan\left(\frac{x}{2}\right)}-\sqrt{1+\sin x}-\dfrac{x^{2}}{4}}{\arcsin x-\arctan x}$

1002) $\lim\limits_{x\to 0}\dfrac{\sqrt[3]{1+3x+x^{2}}+\sin\left[\ \ln\left(1-x\right)\ \right]-e^{-\frac{7x^{2}}{6}}}{x-\arctan x}$

1003) $\lim\limits_{x\to 0}\dfrac{\sqrt{1+sh\left(2x\right)}-\cos x-x}{\tan x-\arctan\left(\sin x\right)}$

1004) $\lim\limits_{x\to 0}\dfrac{\sqrt{2-e^{2x}}-\cos 2x+\ln\left(1+x\right)}{\sin x-\arcsin\left(\tan x\right)}$

1005) $\lim\limits_{x\to 0}\dfrac{xe^{\tan x}-\sin^{2}x-x}{x+x^{3}-\tan x}$

1006) $\lim\limits_{x\to 0}\dfrac{\sqrt[3]{1+x^3}-x\cot x-\dfrac{1}{3}x^2}{x\cos x-\sin x}$

1007) $\lim\limits_{x\to 0}\dfrac{\cos x-\sqrt{1-2x}-x}{x^2\tan x-e^{-x^3}+1}$

1008) $\lim\limits_{x\to 0}\dfrac{\sin x-\ln\left(\sin x+\sqrt{1+x^2}\right)}{\tan x-x\cos^2 x}$

1009) $\lim\limits_{x\to 0}\dfrac{e^{e^x-1}-\dfrac{1}{1-x}}{\ln\left(\dfrac{1+x}{1-x}\right)-2\sin x}$

1010) $\lim\limits_{x\to 0}\dfrac{\tan\left(\sin x\right)-\ln\left(x+\sqrt[3]{1+x^2}\right)-\dfrac{x^2}{6}}{th\left(x-x^3\right)-x}$

1011) $\lim\limits_{x\to 0}\dfrac{e^{2x}-ch2x-2x}{\tan 2x-2\sin x}$

1012) $\lim\limits_{x\to 0}\dfrac{\ln\left(1+x-\dfrac{1}{6}x^2\right)-shx+\dfrac{2}{3}x^2}{\sin 2x-2x\cos x}$

1013) $\lim\limits_{x\to 0}\dfrac{x^2e^{2x}+\ln\left(1-x^2\right)}{x\cos x-\sin x}$

1014) $\lim\limits_{x\to 0}\dfrac{\arcsin x+3\cos x-3.\sqrt[3]{1+x}}{1+\ln\left(1+x\right)-e^x}$

1015) $\lim\limits_{x\to 0}\dfrac{x^2e^x-\ln\left(1+x^2\right)-\arcsin\left(x^3\right)}{x\sin x-x^2}$

1016) $\lim\limits_{x\to 0}\dfrac{e^{1+\tan x}-e^{\sqrt{1+2x}}}{\sin\left(\dfrac{x^2}{7}\right)-\dfrac{x}{3}\ln\left(1-x\right)}$

1017) $\lim\limits_{x\to 0}\dfrac{e^x-\sqrt{1+2x+2x^2}}{x+\tan x-\sin 2x}$

1018) $\lim\limits_{x\to 0}\dfrac{\tan\left(\sin x\right)-x\cos x}{e^x+\ln\left(1-x\right)-1}$

1019) $\lim\limits_{x\to 0}\dfrac{e^x-x\sqrt{1+x}-1}{\sin x\,.\,chx-shx}$

1020) $\lim\limits_{x\to 0}\dfrac{\tan x-\ln\left(x+\sqrt{1+x^2}\right)}{\sin x-x\cos x}$

1021) $\lim\limits_{x\to 0}\dfrac{e^{x-x^2}-\ln\left(1+\sin x\right)-1}{x\cos x-shx}$

1022) $\lim\limits_{x\to 0}\dfrac{2\ln\left(\cos x\right)+xshx}{\sin\left(\dfrac{x^2}{2}\right)-sh\left(\dfrac{x^2}{2}\right)}$

1023) $\lim\limits_{x\to 0}\dfrac{e^{x^2}.\tan x-x\cos\left(\sin x\right)}{\ln\left(1+x\right)-x\sqrt{1-x}}$

1024) $\lim\limits_{x\to 0}\dfrac{\arcsin x-xe^x}{x\sqrt{1-x^2}-\tan x}$

1025) $\lim\limits_{x\to 0}\dfrac{\sqrt{1-2x}+e^{\tan x}-2}{\dfrac{\sin x}{x}-\cos x-\dfrac{x^2}{3}}$

1026) $\lim\limits_{x\to 0}\dfrac{\sqrt{\cos x-x\ln\left(1+x\right)}+\dfrac{3}{4}\tan\left(x^2\right)-1}{xe^x-\arcsin x-x^2}$

1027) $\lim\limits_{x\to 0}\dfrac{sh2x+\ln\left(1-\sin x\right)-\sin\left[\ \ln\left(1+x\right)\ \right]}{\left(1-2x\right)^{-\frac{1}{2}}-e^x-x^2}$

1028) $\lim\limits_{x\to 0}\dfrac{\left(1-2x\right)^{-\frac{1}{2}}-\left(1+2x\right)^{-\frac{1}{2}}-\arctan\left(2x\right)}{e^{-x}+\ln\left(1+\arcsin x\right)-1}$

1029) $\lim\limits_{x\to 0}\dfrac{\ln\left[\ e^{\sin x}+\ln\left(1-x\right)+\dfrac{x^3}{3}\ \right]}{\ln\left(chx\right)-\dfrac{x^2}{2}}$

1030) $\lim\limits_{x\to 0}\dfrac{\sin\left(\arctan x\right)-\tan x}{e^{shx}-\left(1+2x\right)^{\frac{1}{2}}-x^2}$

1031) $\lim\limits_{x\to 0}\dfrac{\sqrt[3]{1+x^2}-e^{\frac{x^3}{4}}}{\ln\left(1+3x^2\right)-3x^2\cos x}$

1032) $\lim\limits_{x\to 0}\dfrac{\ln\left(\sqrt{1+x^2}-x\right)+\tan x}{x\left(chx-e^{x^2}\right)}$

1033) $\lim\limits_{x\to 0}\dfrac{\sqrt[3]{\ln\left(e+x\right)}-e^{\frac{x}{3e}}+\dfrac{x^{2}}{3e^{2}}}{xchx-\sin x}$

1034) $\lim\limits_{x\to 0}\dfrac{e^{\sin x}-\sqrt{1+x^{2}}-\arcsin x}{sh\left(x-x^{2}\right)-\ln\left(\sqrt{1+2x}\right)}$

1035) $\lim\limits_{x\to 0}\dfrac{ch\left(\dfrac{2x}{2+x^{4}}\right)+\cos\left(\dfrac{2x}{2-x^{4}}\right)-2e^{\frac{x^{4}}{2}}}{\tan\left(\sqrt{1+x^{4}}\right)-\tan\left(\sqrt{1-x^{4}}\right)}$

1036) $\lim\limits_{x\to 0}\dfrac{e^{1+\cos x}-e^{2+x^{2}}+\dfrac{3}{2}e^{2}\sin\left(x^{2}\right)}{\ln\left(1+x^{2}\right)-\left(\arctan x\right)^{2}}$

1037) $\lim\limits_{x\to 0}\dfrac{\ln\left(1+\sin 2x\right)-2x+2x^{2}}{\dfrac{x}{2}+\tan\left(\dfrac{x}{2}\right)-\arcsin x}$

1038) $\lim\limits_{x\to 0}\dfrac{\sqrt{1+\sin x}-\dfrac{1}{2}\tan x+\dfrac{1}{8}x^{2}-1}{e^{x}-\sqrt{1+2x}-x^{2}}$

1039) $\lim\limits_{x\to 0}\dfrac{\sqrt{1+2x}-e^{\tan x}+6x^{3}+x^{2}}{\ln\left(1+x\right)-\arctan x+\dfrac{x^{2}}{2}}$

1040) $\lim\limits_{x\to 0}\dfrac{ch2x-\left(1+3x\right)^{-\frac{1}{3}}-x}{\dfrac{1}{2}x^{2}+\ln\left(1+\tan x\right)-\arcsin x}$

1041) $\lim\limits_{x\to 0}\dfrac{e^{\frac{x}{1-x}}-shx-\cos x}{\sqrt[6]{1+x}+\sqrt[4]{1-x}-2}$

1042) $\lim\limits_{x\to 0}\dfrac{x+chx-e^{\arcsin x}}{\tan x+\sqrt[3]{1-3x}-2\cos x+1}$

1043) $\lim\limits_{x\to 0}\dfrac{\sqrt{2x+\cos 2x}-e^{\tan x}+2x^2}{2\sin x-2\ln\left(1+x\right)-x^2}$

1044) $\lim\limits_{x\to 0}\dfrac{sh\left[\sin\left(x^3\right)\right]+\sin\left[sh\left(x^3\right)\right]}{\dfrac{x^2}{2}\sqrt{1-x}+\ln\left(1+x\right)-x\cos x}$

1045) $\lim\limits_{x\to 0}\dfrac{\tan^2 x-\tan\left(x^2\right)}{e^{\arcsin x}-e^{\sin x}-\dfrac{1}{2}x^3}$

1046) $\lim\limits_{x\to 0}\dfrac{\ln\left(\dfrac{\sin x}{x}\right)+ch\left(\dfrac{x}{\sqrt{3}}\right)-1}{shx-\ln\left(x+\sqrt{1+x^2}\right)}$

1047) $\lim\limits_{x\to 0}\dfrac{3\arctan\left(\sin x\right)-\tan\left(sh3x\right)}{\sqrt{1+x}\,.\sin\left(x^3\right)-x^2\ln\left(1-\dfrac{16}{9}x\right)}$

1048) $\lim\limits_{x\to 0}\dfrac{\sin\sqrt{1+x^3}-\sin 1}{\sqrt[5]{1-2x\ln\left(\cos x\right)}-1}$

1049) $\lim\limits_{x\to 0}\dfrac{\arctan\left(3+x^2\right)-\arctan\left(2+\cos x\right)}{\ln\left(1+x\right)-e^x+1}$

1050) $\lim\limits_{x\to 0}\dfrac{\arcsin\left(\dfrac{1}{2}+x^{2}\right)-\arcsin\left(\cos x-\dfrac{1}{2}\right)}{1+\ln\left(1+x^{2}\right)-\cos x}$

1051) $\lim\limits_{x\to 0}\dfrac{e^{x^{2}}-\sqrt{1+2x^{2}}}{\tan^{4}x}$

1052) $\lim\limits_{x\to 0}\dfrac{e^{x}+\ln\left(1-\sin x\right)-1}{\sqrt[3]{8-x^{4}}-2}$

1053) $\lim\limits_{x\to 0}\dfrac{\ln\left(\cos x+\dfrac{x^{2}}{2}\right)}{e^{-\frac{x^{2}}{2}}-\cos x}$

1054) $\lim\limits_{x\to 0}\dfrac{e^{\frac{x}{1+x}}-\cos\left(1-e^{-x}\right)-\arctan x}{x^{4}}$

1055) $\lim\limits_{x\to 0}\dfrac{x\sqrt{e^{x}-\sqrt{1+2x}}-\sqrt[3]{x^{6}-x^{7}}}{\dfrac{1}{e}\left(1+x\right)^{\frac{1}{x}}-\sqrt{1-x+\dfrac{7x^{2}}{6}}}$

1056) $\lim\limits_{x\to 0}\dfrac{x\sqrt{\ln\left(1+x\right)+\cos x+\dfrac{4x^{3}}{3}-\sqrt[3]{1+3x}}}{\sqrt{1-x+\dfrac{x^{2}}{2}}-\left(\cos x\right)^{\frac{1}{x}}}$

1057) $\lim\limits_{x\to 0}\dfrac{\sin\left(xe^{x}\right)+\sin\left(xe^{-x}\right)-2x-\dfrac{2}{3}x^{3}}{x^{5}}$

1058) $\lim\limits_{x\to 0}\dfrac{\sin\left(x\cos x\right)+x\ln\left(1+\dfrac{2}{3}x^{2}\right)-x}{\sqrt{1+x^{5}}-1}$

1059) $\lim\limits_{x\to 0}\dfrac{\sqrt[3]{1-\dfrac{x^{2}}{2}}-e^{-\frac{x^{2}}{6}}}{x^{2}\ln\left(1+x\right)-\tan\left(x^{3}\right).\cos\left[\ sh\left(\dfrac{x}{2}\right)\ \right]}$

1060) $\lim\limits_{x\to 0}\dfrac{\ln\left(\cos x+x\sin x\right)-\dfrac{x^{2}}{2}e^{x}}{\dfrac{x}{2}.\sqrt[3]{1-x}+\sqrt{1+\dfrac{x^{2}}{3}}-\sin\left(\dfrac{x}{2}\right)-1}$

1061) $\lim\limits_{x\to 0}\dfrac{e^{\cos x}-e.\sqrt[3]{1-4x^{2}}}{\dfrac{1}{x}\arcsin\left(2x\right)-2ch\left(x^{2}\right)}$

1062) $\lim\limits_{x\to 0}\dfrac{\ln\left(\sqrt{1+2x}-\tan x\right)+\dfrac{1}{2}\arctan\left(x^{2}\right)}{xe^{x^{2}}-\sin x}$

1063) $\lim\limits_{x\to 0}\dfrac{\sqrt{1-2x}-e^{-x}+x^{2}.\sqrt[3]{1+x}}{\sin^{2}x-\ln\left(ch^{2}x\right)}$

1064) $\lim\limits_{x\to 0}\dfrac{\ln\left(1+x\right)+\dfrac{1}{2}sh\left(x^{2}\right)-x}{\sqrt{1+\tan x}-\sqrt{1+\sin x}}$

1065) $\lim\limits_{x\to 0}\dfrac{\dfrac{\left(1+3x\right)^{\frac{1}{3}}-1}{\tan x}-e^{-shx}-\dfrac{x^{2}\left(x+5\right)}{x+6}}{\dfrac{\ln\left(2e^{x^{2}}-1\right)}{\sin x}-\arctan 2x}$

1066) $\lim\limits_{x\to 0}\dfrac{\dfrac{\sqrt{\cos 2x + sh2x} - e^{x}}{x} + \dfrac{2x\left(2-x\right)}{2+x}}{\dfrac{\ln\left(chx\right)}{shx} - \dfrac{1}{2}\arcsin x}$

1067) $\lim\limits_{x\to 0}\left(\sqrt{1+x} - x\right)^{\frac{1}{x}}$

1068) $\lim\limits_{x\to 0}\left(\cos x\right)^{\cot^{2} x}$

1069) $\lim\limits_{x\to 0}\left(chx\right)^{\frac{1}{\sin^{2} x}}$

1070) $\lim\limits_{x\to 0}\left(\dfrac{\cos x}{ch3x}\right)^{\frac{1}{x^{2}}}$

1071) $\lim\limits_{x\to 0}\left(\dfrac{e^{x^{2}}}{ch3x}\right)^{\frac{1}{x^{2}}}$

1072) $\lim\limits_{x\to 0}\left[\ \ln\left(e+x\right) - \dfrac{x}{e}\ \right]^{\frac{1}{\sin^{3} x}}$

1073) $\lim\limits_{x\to 0}\left(\dfrac{\arcsin x}{x}\right)^{\frac{1}{x^{2}}}$

1074) $\lim\limits_{x\to 0}\left[\ \dfrac{\ln\left(\sqrt{1+x^{2}} + x\right)}{x}\ \right]^{\frac{1}{x^{2}}}$

1075) $\lim\limits_{x\to 0}\left(\dfrac{\sin x}{\arcsin x}\right)^{\frac{1}{x^2}}$

1076) $\lim\limits_{x\to 0}\left(\dfrac{\tan x}{\arctan x}\right)^{\frac{1}{x^2}}$

1077) $\lim\limits_{x\to 0}\left[\dfrac{\sin x}{2\left(\sqrt{1+x}-1\right)}\right]^{\cot x}$

1078) $\lim\limits_{x\to 0}\left[\dfrac{\sqrt{1-2x}-\sqrt[3]{1-3x}}{\ln\left(chx\right)}\right]^{\frac{1}{x}}$

1079) $\lim\limits_{x\to 0}\left(\dfrac{1}{x}e^{\frac{x}{1+x}}-\dfrac{1}{\sin x}\right)^{\frac{1}{\arctan x}}$

1080) $\lim\limits_{x\to 0}\left(\dfrac{\tan 3x+\cos 4x-\cos 2x}{\ln\sqrt{1+3x}-\ln\sqrt{1-3x}}\right)^{\frac{1}{\sin x}}$

1081) $\lim\limits_{x\to 0}\left(1+6\times\dfrac{x-\sin x}{x^2}\right)^{\frac{2\left(chx-1\right)}{x^2}}$

1082) $\lim\limits_{x\to 0}\left[\dfrac{e^2-\left(1+2x\right)^{\frac{1}{x}}}{2xe^2}\right]^{\frac{1}{x}}$

1083) $\lim\limits_{x\to 0}\left(\dfrac{chx-\cos x}{2\sqrt{1+2x}-2.\sqrt[3]{1+3x}}\right)^{\frac{1}{x}}$

1084) $\lim\limits_{x\to 0}\left[\sqrt{1+\tan 2x}+\ln\left(1-x\right)\right]^{\frac{1}{x^2}}$

1085) $\lim\limits_{x\to 0}\left[\tan\left(\frac{x}{3}\right)+2-\sqrt[3]{1+x}\right]^{\cot^2 x}$

1086) $\lim\limits_{x\to 0}\left(e^{\frac{1}{3}\sin x}+\sqrt[3]{1-\tan x}-1\right)^{\frac{1}{\ln\left(1+x^2\right)}}$

1087) $\lim\limits_{x\to 0}\left[\frac{1}{e}\left(1+x\right)^{\frac{1}{x}}+\frac{2x}{4+5x}\right]^{\cot^2 x}$

1088) $\lim\limits_{x\to 0}\left(\frac{\arctan x}{e^{x}-1-\frac{x^2}{2}}\right)^{\frac{1}{x^2}}$

1089) $\lim\limits_{x\to 0}\left[\frac{xshx}{\ln\left(1+x^2\right)}\right]^{\cot^2 x}$

1090) $\lim\limits_{x\to 0}\left(\frac{2\cos x+x}{2\sqrt{1+x}}\right)^{\frac{1}{x^2}}$

1091) $\lim\limits_{x\to 0}\left(\frac{x\sin x}{2chx-3}\right)^{\frac{1}{x^2}}$

1092) $\lim\limits_{x\to 0}\left(\frac{\sqrt{1+x}-\sqrt{1-x}}{shx}\right)^{\frac{1}{\sin^2 x}}$

1093) $\lim\limits_{x\to 0}\left(\dfrac{1+x^2-\sqrt{1+x^2}}{chx-1}\right)^{\frac{1}{x^2}}$

1094) $\lim\limits_{x\to 0}\left[\dfrac{\sqrt{\cos x}}{e^x-\ln\left(1+x\right)}\right]^{\frac{1}{x^2}}$

1095) $\lim\limits_{x\to 0}\left[\dfrac{\sqrt{\cos x}}{\sqrt{1+\tan\left(x^2\right)}}\right]^{\frac{1}{x^2}}$

1096) $\lim\limits_{x\to 0}\left[\dfrac{\left(\arcsin x\right)^2-x^2}{\sin^2\left(\dfrac{x^2}{\sqrt{3}}\right)}\right]^{\frac{1}{\sin^2 x}}$

1097) $\lim\limits_{x\to 0}\left[\dfrac{\arctan\left(\dfrac{2x}{2-x^2}\right)-x}{x\sin\left(\dfrac{x^2}{6}\right)}\right]^{\cot^2 x}$

1098) $\lim\limits_{x\to 0}\left[\dfrac{x^2-\left(\arctan x\right)^2}{x^2\sin\left(\dfrac{2}{3}x^2\right)}\right]^{\frac{1}{x^2}}$

1099) $\lim\limits_{x\to 0}\left[\dfrac{3\arccos\left(1-2x^2\right)-6x}{x^3}\right]^{\frac{1}{x^2}}$

1100) $\lim\limits_{x\to 0}\left(\dfrac{2e^{x-x^2}-2}{2x-x^2}\right)^{\frac{\sin x}{x^3}}$

1101) $\lim\limits_{x\to 0}\left(\dfrac{\sqrt{\cos x}}{\sqrt{1+x}-\dfrac{1}{2}shx}\right)^{\frac{1}{\arcsin\left(x^2\right)}}$

1102) $\lim\limits_{x\to 0}\left[\dfrac{sh\left(x+\sin x\right)}{\sin x+\arcsin x}\right]^{\cot^2 x}$

1103) $\lim\limits_{x\to 0}\left[\dfrac{\ln\left(1+x\right)}{x}+\dfrac{x}{\ln\left(e^2-xe^2\right)}\right]^{\frac{1}{x^2}}$

1104) $\lim\limits_{x\to 0}\left(\dfrac{\arcsin 5x-\arcsin 3x-\arctan x}{x}\right)^{\frac{1}{\ln\left(\cos 3x\right)}}$

1105) $\lim\limits_{x\to 0}\left[\dfrac{\sin\left(2x+x^3\right)-sh\left(x+2x^3\right)}{x}\right]^{\frac{1}{2\ln\left(1+x^2\right)-\ln^2\left(1+x\right)}}$

1106) $\lim\limits_{x\to 0}\left[\dfrac{\tan\left(2x+x^3\right)-th\left(x+2x^3\right)}{x}\right]^{\frac{1}{\sqrt[3]{1+x^3}-\sqrt{1+x^2}}}$

1107) $\lim\limits_{x\to 0}\left(\cos 2x+\dfrac{xe^{x}}{1-x}-x\right)^{\frac{1}{x^{3}}}$

1108) $\lim\limits_{x\to 0}\left(\sqrt[3]{1+2x+x^{3}}-\dfrac{2x}{2x+3}\right)^{\frac{1}{x^{3}}}$

1109) $\lim\limits_{x\to 0}\left[\dfrac{2x}{x-2}+\ln\left(e+xe^{x+1}\right)\right]^{\frac{1}{x^{3}}}$

1110) $\lim\limits_{x\to 0}\left(\dfrac{2-x}{2+x}+\sin\left(\ln\left(1+x\right)\right)\right)^{\frac{1}{x^{3}}}$

1111) $\lim\limits_{x\to 0}\left[x-\ln\left(1+x\right)+\cos\left(xe^{-x}\right)\right]^{\frac{1}{x^{3}}}$

1112) $\lim\limits_{x\to 0}\left(e^{\sin x}-e^{2x-x^{2}}+e^{\tan x}\right)^{\frac{1}{x^{3}}}$

1113) $\lim\limits_{x\to 0}\left[1+\dfrac{1}{2}\ln\left(\dfrac{1+x}{1-x}\right)-\arctan x\right]^{\frac{1}{\arcsin\left(x^{3}\right)}}$

1114) $\lim\limits_{x\to 0}\left[\dfrac{e^{x}-x}{\sqrt{1+x^{2}}-\ln\left(1+x^{3}\right)}\right]^{\frac{1}{x^{3}}}$

1115) $\lim\limits_{x\to 0}\left[\sqrt[3]{8+x^{3}}-\cos\left(x^{2}\right)\right]^{\frac{1}{\arcsin\left(x^{3}\right)}}$

1116) $\lim\limits_{x\to 0}\left(\cos x-x+e^{\arctan x}-1\right)^{\frac{1}{\sin^{3}x}}$

1117) $\lim\limits_{x\to 0}\left[\ \frac{3}{2}x^2+\sqrt[3]{1+3\sin x}+\ln\left(1-x\right)\ \right]^{\frac{1}{sh^3 x}}$

1118) $\lim\limits_{x\to 0}\left(\sqrt[3]{1-3x\cos 2x}+4x^2+\frac{x}{1+3x}\right)^{\frac{1}{\left(\arcsin x\right)^3}}$

1119) $\lim\limits_{x\to 0}\left[\ e^{\tan x}+\ln\left(1-x\right)\ \right]^{\cot\left(x^3\right)}$

1120) $\lim\limits_{x\to 0}\left(\sqrt{1+\sin x}-\frac{1}{2}\tan x+\frac{1}{8}x^2\right)^{\cot\left(x^3\right)}$

1121) $\lim\limits_{x\to 0}\left[\ \sqrt{1-2x+3x^2}+x\left(1-shx\right)\ \right]^{\cot^3 x}$

1122) $\lim\limits_{x\to 0}\left(e^{\sin x}-\frac{x^2}{2}+\cos x-\sqrt{1+2x}\right)^{\frac{1}{\tan\left(x^3\right)}}$

1123) $\lim\limits_{x\to 0}\left[\ \ln\left(1-x\right)+e^{x\cos x}\ \right]^{\frac{1}{x^2.\left(\sqrt{1+3x}-1\right)}}$

1124) $\lim\limits_{x\to 0}\left[\ \frac{2}{\pi}\arccos x+\sin\left(\frac{2x}{\pi}\right)\ \right]^{\frac{1}{\sqrt{1+2x^3}-1}}$

1125) $\lim\limits_{x\to 0}\left[\ 1+th\left(xe^x\right)+\frac{1}{2}\ln\left(1-2x\right)\ \right]^{\frac{1}{x^3}}$

1126) $\lim\limits_{x\to 0}\left(e^{\arctan x}-\frac{1}{1-x}+\cos x+x^2\right)^{\frac{1}{\sin\left(x^3\right)}}$

1127) $\lim\limits_{x\to 0}\left(1+2\arctan x-sh2x\right)^{\frac{1}{\ln^3(1-x)}}$

1128) $\lim\limits_{x\to 0}\left(e^{\sin x}-\dfrac{x^2}{2}-x\cos x\right)^{\frac{1}{\ln^3\left(1-\frac{x}{2}\right)}}$

1129) $\lim\limits_{x\to 0}\left(\sqrt[3]{1+\tan x}-\dfrac{x}{3}e^{-\frac{x}{3}}\right)^{\frac{1}{x\ln(\cos x)}}$

1130) $\lim\limits_{x\to 0}\left[\dfrac{e^{-x}}{1-x}+\dfrac{1}{2}\left(\ln\sqrt{1+2x}-\tan x\right)\right]^{\frac{1}{x(\cos x-1)}}$

1131) $\lim\limits_{x\to 0}\left(e^{x-x^2}-x.\sqrt[3]{1-\dfrac{3}{2}x}\right)^{\frac{1}{\tan x-x}}$

1132) $\lim\limits_{x\to 0}\left(\sqrt{1+2\tan x}+\dfrac{x^2}{2}-\sin x\right)^{\frac{1}{shx-\arctan x}}$

1133) $\lim\limits_{x\to 0}\left(1-\sin x+\arctan x\right)^{\frac{1}{shx-\sin x}}$

1134) $\lim\limits_{x\to 0}\left[1+\sqrt{1-x}\,.\ln(1+x)-\dfrac{x}{1+x}\right]^{\frac{1}{\tan x-shx}}$

1135) $\lim\limits_{x\to 0}\left[\cos(\sin x)+\dfrac{1}{2}\arctan\left(x^2\right)+4x^3\right]^{\frac{1}{\tan x-shx}}$

1136) $\lim\limits_{x\to 0}\left(e^{\sin 2x}-2x-2x^2\right)^{\frac{1}{\sin\left(x^4\right)}}$

1137) $\lim\limits_{x\to 0}\left[\ e^{\sin x}+\ln\left(1-x\right)+\frac{x^3}{3}\ \right]^{\frac{1}{x^4}}$

1138) $\lim\limits_{x\to 0}\left[\ \frac{x+\sin x-\ln\left(\ x+\sqrt{1+x^2}\ \right)}{x}\ \right]^{\frac{1}{x^4}}$

1139) $\lim\limits_{x\to 0}\left[\ \frac{\arctan\left(shx\right)}{\sin x}\ \right]^{\frac{1}{\sin^4 x}}$

1140) $\lim\limits_{x\to 0}\left[\ \frac{\arcsin\left(x\cos x\right)}{\arctan x}\ \right]^{\frac{1}{\sin\left(x^4\right)}}$

1141) $\lim\limits_{x\to 0}\left(1+\sin x\,.\arcsin x-x^2e^{x^2}\ \right)^{\frac{1}{\sin^2\left(x^2\right)}}$

1142) $\lim\limits_{x\to 0}\left(1+\tan x\,.\arctan x-x^2ch^2x\right)^{\frac{1}{\left(1-\cos x\right)^2}}$

1143) $\lim\limits_{x\to 0}\left[\ 1+thx\,.\ln\left(\frac{1+x}{1-x}\right)-2x^2\cos\left(x^2\right)\ \right]^{\frac{1}{x^4}}$

1144) $\lim\limits_{x\to 0}\left[\ \log_2\left(\frac{3-4x}{1-2x}-\frac{1+4x}{1+2x}\right)\ \right]^{\frac{2shx}{x-\sin x}}$

1145) $\lim\limits_{x\to 0}\left[\ 1+shx\,.\ln\left(\ x+\sqrt{1+x^2}\ \right)-x^2\cos\left(x^2\right)\ \right]^{\frac{1}{x^4}}$

1146) $\lim\limits_{x\to 0}\left[\ \cos\left(\sin x\right)+\frac{1}{2}\arctan\left(x^2\right)\ \right]^{\frac{1}{\sin\left(x^4\right)}}$

1147) $\lim\limits_{x\to 0}\left[\ \frac{chx+2\cos x}{3}+\frac{x^2}{6\left(1+x^2\right)}\ \right]^{\frac{1}{\arctan\left(x^4\right)}}$

1148) $\lim\limits_{x\to 0}\left(\frac{2x}{\sin 2x}-\frac{2}{3}x^2\right)^{\frac{x^2}{x^2-\arctan\left(x^2\right)}}$

1149) $\lim\limits_{x\to 0}\left(\cos x+x^2.\sqrt{x+\frac{1}{4}}\right)^{\frac{x+e}{\arcsin\left(x^3\right)}}$

1150) $\lim\limits_{x\to 0}\left[\ \sqrt[3]{1+3x}-\tan\left(\sin x\right)+x^2\ \right]^{\frac{1}{\arctan x-x\cos x}}$

1151) $\lim\limits_{x\to 0}\left[\ 1-\frac{\left(1+x^2\right)^{\frac{1}{x^2}}-e^{\cos x}}{e}\ \right]^{\frac{1}{\sqrt{ch2x}-e^{x^2}}}$

1152) $\lim\limits_{x\to 0}\left[\ \cos\left(2x+x^2\right)+2\arcsin\left(xe^x\right)-2x\ \right]^{\cot^3 x+\frac{1}{3x^3}}$

1153) $\lim\limits_{x\to 0}\left[\ 1+\arcsin\left(x^3\right)\ \right]^{\frac{e^x}{x.\sqrt[3]{\cos x}-\sin x+\tan^3 x}}$

1154) $\lim\limits_{x\to 0}\left(\frac{2}{\pi}\right)^{\frac{1}{x^3}}\times\left[\ \arccos\left(shx\right)+x\ \right]^{\cot\left(x^3\right)}=e^{-\frac{2}{3\pi}}$

1155) $\lim\limits_{x\to 0}\left[\ \frac{6}{\pi}\arcsin\left(\frac{1}{2}e^{\pi x^2}\right)+sh^2x\ \right]^{\frac{1}{x^2}}=e^{1+2\sqrt{3}}$

1156) $\lim\limits_{x\to 0}\left[\ \frac{4\arctan\left(ch3x\right)+\sin^2 x}{\pi}\ \right]^{\frac{1}{x^2}}=e^{\frac{10}{\pi}}$

1157) $\lim\limits_{x\to 0}\left[\ \frac{2\ln\left(1+x\right)}{x^2}-\frac{2}{\left(x+1\right)shx}\ \right]^{\cot x}$

1158) $\lim\limits_{x\to 0}\left[\ \frac{6}{\ln\left(1+3\sin^2 x\right)}-\frac{4}{\ln\left(2-\cos 2x\right)}\ \right]^{\frac{1}{x^2}}$

1159) $\lim\limits_{x\to +\infty}\left(chx\right)^{x^2\left(\tan\frac{1}{x}-\arctan\frac{1}{x}\right)}$

1160) $\lim\limits_{x\to \infty}e^{-\frac{x^2}{3}}\times\left[\ \frac{x}{2}\ln\left(\frac{x+1}{x-1}\right)\ \right]^{x^4}$

1161) $\lim\limits_{x\to +\infty}\left(\frac{\sqrt{x^2-x}}{x}+\frac{1}{4}\sin\frac{2}{x}\right)^{x^2+\sin 3x}$

1162) $\lim\limits_{x\to \infty}\left(\frac{x^4+x^2+1}{x^4-x^2-1}\right)^{x^4\sin^2\left(\frac{1}{x}\right)}$

1163) $\lim\limits_{x\to +\infty}\left[\ x\ln\left(1+x\right)-x\ln x+\arctan\left(\frac{1}{2x}\right)\ \right]^{x^2\arctan x}$

1164) $\lim\limits_{x\to+\infty}\left(\ln\left(\tan^2\left(\ln\left(\frac{x+1}{x}\right)\right)\right)-sh^2\left(\frac{1}{x}\right)+\frac{1}{x^3}\right)+4\ln x$

1165) $\lim\limits_{x\to+\infty}e^{-\frac{x^2}{2}}\times\left(\frac{\sqrt{x^2+2x}-\sqrt{x^2-2x}}{2}\right)^{x^4}$

1166) $\lim\limits_{x\to0^+}\left[\,shx-\ln\left(x+\sqrt{1+x^2}\right)\right]^{\frac{1}{\ln x}}$

1167) $\lim\limits_{x\to0^+}\left[\,\frac{x}{3}+\cot x-\frac{1}{x}\cos\left(\frac{x^2}{3}\right)\right]^{\frac{1}{\ln(\sin x)}}$

1168) $\lim\limits_{x\to0^+}\left(1+\frac{1}{\sin x}-\frac{1}{\arcsin x}\right)^{\frac{1}{x+\ln^2 x}}$

1169) $\lim\limits_{x\to0^+}\left(\frac{x}{\sin x}-\frac{shx}{x}+\frac{\sin^4 x}{10}\right)^{\frac{1}{\ln(\tan x)}}$

1170) $\lim\limits_{x\to0^+}\left(\frac{shx}{\arctan x}\right)^{\frac{1}{x^2+\ln x}}$

1171) $\lim\limits_{x\to\left(\frac{\pi}{2}\right)^-}\left[\left(\frac{\pi}{2}-x\right)\tan x\,\right]^{\tan x}$

1172) $\lim\limits_{x\to1}\left(e^{x-1}-\ln x\right)^{\frac{1}{\sin(x-1)+\cos(x-1)-x}}$

1173) $\lim\limits_{x\to1}\left[\,e^{\sin(x-1)}-\ln x\,\right]^{\cot^2(x-1)}$

1174) $\lim\limits_{x\to 1}\left(\sqrt{x}-\frac{1}{2}\ln x\right)^{\frac{1}{\cos^2 x.\sin^2(1-x)}}$

1175) $\lim\limits_{x\to 1}\left(x-\ln x\right)^{\frac{1}{\cos^2 x.\sin^2(1-x)}}$

1176) $\lim\limits_{x\to 1}\left(2^{x-1}-x^{x}\ln 2\right)^{\frac{1}{\sin(x-1)-\cos(1-x)+x}}$

1177) $\lim\limits_{x\to 1^+}\left[\ \ln\left(x^2-x\right)-\ln\left(x-1\right)+e^{1-x}\ \right]^{\frac{1}{\arcsin\left[(x-1)^3\right]}}$

1178) $\lim\limits_{x\to 1}\left(\frac{1}{\ln x}-\frac{2}{x^2-1}\right)^{\frac{1}{\sin(x-1)}}$

1179) $\lim\limits_{x\to 1}\dfrac{e^{\frac{x-1}{x}}-\sqrt[4]{4x-3}}{ch\left(x-1\right)-\cos\left[\ 2\left(x-1\right)\ \right]}$

1180) $\lim\limits_{x\to 1}\dfrac{3.\sqrt[3]{x}-\arcsin\left(x-1\right)-3\cos\left(x-1\right)}{e^{x-1}-1-\ln x}$

1181) $\lim\limits_{x\to 1}\dfrac{2\sqrt{x}-\sin\left(x-1\right)-2\cos\left(x-1\right)}{\arctan\left(x-1\right)-\ln x}$

1182) $\lim\limits_{x\to 1}\left[\ \frac{\pi}{2}\tan\left(\frac{\pi x}{2}\right)-\frac{1}{1-x}\ \right]$

1183) $\lim\limits_{x\to 0}\left[\ \sqrt{\frac{1}{x\left(x-1\right)}+\frac{1}{x^2}}-\frac{1}{x}\ \right]$

1184) $\lim\limits_{n\to\infty}\dfrac{2}{\sqrt{2}}\times\dfrac{2}{\sqrt{2+\sqrt{2}}}\times\cdots\times\dfrac{2}{\underbrace{\sqrt{2+\sqrt{2+\sqrt{2+\cdots+\sqrt{2}}}}}_{n\ times}}=\dfrac{\pi}{2}$

1185) $\lim\limits_{n\to\infty}\left(\dfrac{1^m+2^m+3^m+\cdots+n^m}{n^m}-\dfrac{n}{m+1}\right)=\dfrac{1}{2}$

1186) $\lim\limits_{n\to\infty}\left[\dfrac{1^m+3^m+5^m+\cdots+\left(2n-1\right)^m}{n^m}-\dfrac{2^m n}{m+1}\right]=0$

1187) $\lim\limits_{n\to\infty}\left[\sin\left(\dfrac{\pi}{2}\times\dfrac{2n+1}{2n-1}\right)\right]^{\tan\left(\frac{\pi}{2}\times\frac{n+1}{n+3}\right)}$

1188) $\lim\limits_{x\to+\infty}\left[n.\sqrt{\left(x+a_1\right)\left(x+a_2\right)\times\cdots\times\left(x+a_n\right)}-x\right]$

1189) $\lim\limits_{x\to1}\dfrac{\sin\left(\sin\pi x\right)}{\ln\left(1+\ln x\right)}$

1190) $\lim\limits_{x\to\frac{\pi}{2}}\dfrac{1-e^{\pi x-2x^2}}{\cos x}$

1191) $\lim\limits_{x\to\frac{\pi}{4}}\dfrac{\ln\left(\cot x\right)+2x-\dfrac{\pi}{2}}{\left(1-\tan x\right)^3}$

1192) $\lim\limits_{x\to0^+}\dfrac{x\left(1-x^2\right)^{\frac{1}{2}}-\cos x.\ln\left(1+x\right)}{\ln\left(\sin x\right)-\ln x}$

1193) $\lim\limits_{x\to 0}\left[\dfrac{1}{(x+1)shx}-\dfrac{\ln(1+x)}{x^2}\right]$

1194) $\lim\limits_{x\to\infty} x\left[1-x\ln\left(1+\dfrac{1}{x}\right)\right]$

1195) $\lim\limits_{x\to\infty} x\left[(2e)^{\frac{1}{x}}+e^{\frac{1}{x}}-2\right]$

1196) $\lim\limits_{x\to\infty}\left[x^3\ln\left(1+\dfrac{1}{x}\right)-x^2+\dfrac{x}{2}\right]$

1197) $\lim\limits_{x\to+\infty}\dfrac{\sqrt[6]{x^6+x^5}+\sqrt[6]{x^6-x^5}-2x}{x\ln(1+x)-x\ln x-x\sin\left(\dfrac{1}{x}\right)}$

1198) $\lim\limits_{x\to+\infty}\dfrac{x\left(\sqrt{x^2+x}-x\right)+\cos x.\ln x}{\ln(1+chx)}$

1199) $\lim\limits_{x\to+\infty}\dfrac{x^2\left(\sqrt[3]{x^3+x}-x\right)+\sin x.\ln(1+x)}{\ln\left(1+x+e^{5x}\right)}$

1200) $\lim\limits_{x\to+\infty}\left[e^{\frac{1}{x}}(x^2-x+2)-\sqrt{x^4+x^2+1}\right]$

1201) $\lim\limits_{x\to+\infty}\left[\left(x^3-x^2+\dfrac{x}{2}+1\right)e^{\frac{1}{x}}-\sqrt[4]{x^{12}-x^9+2}\right]$

1202) $\lim\limits_{x\to+\infty}\left(\sqrt[5]{x^5+x^4}-\sqrt[5]{x^5-x^4}\right)$

1203) $\lim\limits_{x\to\infty}\left[\left(x^3+x\right)\sin\left(\frac{1}{x}\right)-\sqrt[3]{x^6-3x^4+1}\right]$

1204) $\lim\limits_{x\to\infty}\left[x^2-\frac{x}{2}-\left(x^3+x+1\right)\ln\left(1+\frac{1}{x}\right)\right]$

1205) $\lim\limits_{x\to\infty}\frac{x^2+1}{x}\left[1-\frac{x^2+1}{x}\ln\left(\frac{x^2+x+1}{x^2+1}\right)\right]$

1206) $\lim\limits_{n\to\infty}\frac{\log\left(\sqrt{1+\sqrt{2}}\times\sqrt[3]{1+\sqrt[3]{2}}\times\cdots\times\sqrt[n]{1+\sqrt[n]{2}}\right)}{1+\frac{1}{2}+\frac{1}{3}+\cdots+\frac{1}{n}}$

1207) $\lim\limits_{n\to\infty}\frac{\sqrt{1+2^2}+\sqrt{1+3^2}+\cdots+\sqrt{1+n^2}}{1+n^2}$

1208) $\lim\limits_{n\to\infty}\frac{\sin\pi+\sin\frac{\pi}{2}+\cdots+\sin\frac{\pi}{n}}{n}$

1209) $\lim\limits_{n\to\infty}\frac{2\sum\limits_{k=1}^{n}\log k-\left[\log\left(2^{2n+1}\right)+\log\left(\pi n\right)\right]}{2n^3}$

1210) $\lim\limits_{n\to\infty}\frac{\frac{C_n^0+C_n^1+\cdots+C_n^n}{\left(a+b\right)\left(a^2+b^2\right)\times\cdots\times\left(a^n+b^n\right)}}{\cos\alpha.\cos2\alpha\times\cdots\times\cos n\alpha}$, $a=e^{i\alpha}$, $b=e^{-i\alpha}$

1211) $\lim\limits_{n\to\infty}\frac{n^2\sin\left(\frac{n}{n^2+1}\right)}{\left(n+1\right)\cos\left(\frac{\pi n-8}{6n-1}\right)}$

1212) $\lim\limits_{n\to\infty}\dfrac{\sqrt[n]{a}+\sqrt[n]{a^2}+\cdots+\sqrt[n]{a^{nb}}}{n}$, $a>0$ & $b\in\mathbb{N}$

1213) $\lim\limits_{n\to\infty}\left[\sin\left(\dfrac{1}{n^2+1}\right)+2\sin\left(\dfrac{1}{n^2+2}\right)+\cdots+n\sin\left(\dfrac{1}{n^2+n}\right)\right]$

1214) $\lim\limits_{n\to\infty}\dfrac{\left(1-\cos\dfrac{b}{2^n}\right).\sin\left(\sqrt[n]{a}-1\right).\left(C_n^0+C_n^1+\cdots+C_n^n\right)^2}{\left(\dfrac{n^3+3}{n^4+5}\right)}$

1215) $\lim\limits_{n\to\infty}\left[1+\tan\left(\dfrac{n}{n^3+2}\right)\right]^{\csc\left(\frac{1}{n^2}\right)}$

1216) $\lim\limits_{n\to\infty}\left(-1\right)^n n!=\infty$

+ ចំពោះ $\alpha>0$, $-1<q<1$, $a>1$ គេបាន

$$q^n\prec n^{-\alpha}\prec\left(\ln n\right)^{-1}\prec 1\prec\ln n\prec n^{\alpha}\prec a^n\prec n!\prec n^n$$

+ $a_n\prec b_n\ \Leftrightarrow\ \lim\limits_{n\to\infty}\dfrac{a_n}{b_n}=0$