លំហាត់

184 limits

ភាគ៤

$$\lim_{n\to\infty}\left[1+\sin\left(\pi\sqrt{2+4n^2}\right)\right]^n=e^{\frac{\pi}{2}}$$

ចងក្រង និង រៀបរៀងដោយ ស៊ឹម សេងគា

ចូរគណនាលីមីតខាងក្រោម ៖

1) $\lim\limits_{x\to 0}\dfrac{x.\sqrt[3]{\cos x}-\sin x}{x^5}$

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

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

4) $\lim\limits_{x\to 0}\dfrac{\ln\left[\cos\left(x^2\right)\right]+\sqrt[6]{1+3x^4}-1}{x^8}$

5) $\lim\limits_{x\to 0}\dfrac{\cos 2x-e^{-2x^2+\frac{4}{3}x^4}}{\tan\left(x^4\right)}$

6) $\lim\limits_{x\to 0}\dfrac{\left(1+x^2\right)^{\frac{1}{x}+5}-e^x}{\ln\left(\cos x\right)}$

7) $\lim\limits_{x\to 0}\dfrac{e^{\frac{x}{3}}-\sqrt{\dfrac{x+3}{3-x}}}{x^3}$

8) $\lim\limits_{x\to 0}\dfrac{\tan x-x.\sqrt[3]{1+x^2}}{x^5}$

9) $\lim\limits_{x\to 0}\dfrac{18.\sqrt[3]{\sin\left(x^3\right)}-18x+x^7}{x^{13}}$

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

11) $\lim\limits_{x\to 0}\dfrac{x\sqrt{1-x^2}-\cos x.\ln(1+x)-\dfrac{x^2}{2}}{\tan x-\sin x}$

12) $\lim\limits_{x\to 0}\dfrac{\sin^2 x-x^2e^{-x}-x^3}{1-\sqrt{1+x^2}.\cos x}$

13) $\lim\limits_{x\to 0}\dfrac{\sin(\sin x)-x+\dfrac{x^3}{3}}{sh(shx)-\tan x}$

14) $\lim\limits_{x\to 0}\dfrac{\ln\left(1-x+x^2+x^3+x^4\right)-\ln\left(1-x+x^2\right)+x^3\cos x-\dfrac{x^5}{2}\times\sqrt[3]{1+3x}}{x^7}$

15) $\lim\limits_{x\to\infty}\left[\ 2x^4\ln\left(1-\dfrac{1}{x}\right)+\sqrt[3]{8x^9+12x^8+14x^7+15x^6+16x^5}\ \right]$

16) $\lim\limits_{x\to 0}\dfrac{\cos 2x-e^{-2x^2-\frac{4}{3}x^4}}{\tan\left(3x^2\right)-3th\left(x^2\right)}$

17) $\lim\limits_{x\to 0}\dfrac{\sqrt[4]{\cos 4x}-\cos\left(2xe^{x^2}\right)}{(\sin 2x-2\tan x)^2}$

18) $\lim\limits_{x\to 0}\dfrac{(\cos x)^{\sin x}-\sqrt{1-x^3}}{x^6}$

19) $\lim\limits_{x\to 0}\dfrac{\ln\left(\cos^2 x\right)+x^2.\sqrt[6]{1+x^2-x^4}}{x^6}$

20) $\lim\limits_{x\to 0}\dfrac{\cos(\sin x)-\sqrt{1-x^2+x^4}}{x^4}$

21) $\lim\limits_{x\to 0}\dfrac{\tan\left(\sin x\right)-shx}{\left(\sqrt[5]{\cos x}-1\right)^{2}.\arctan\left(x^{2}\right)}$

22) $\lim\limits_{x\to 0}\dfrac{e^{x^{2}}\cos x-chx-e^{-x^{2}}chx+\cos x}{x^{6}}$

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

24) $\lim\limits_{x\to 0}\dfrac{\sqrt[3]{1+3\sin x}-e^{-x^{2}}-shx}{\arcsin\left(x^{3}\right)}$

25) $\lim\limits_{x\to 0}\dfrac{e^{x}-\cos x.\sqrt[3]{1+3x+6x^{2}}}{\arcsin\left(2x\right).\tan x.sh\left(3x\right)}$

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

27) $\lim\limits_{x\to 0}\dfrac{\sin\left(xe^{\frac{x^{2}}{6}}\right)-x\cos\left(x^{2}\right)}{x^{2}.\ln\left(1+x^{3}\right)}$

28) $\lim\limits_{x\to 0}\dfrac{\ln\left(\dfrac{\sin x}{x}\right)+e^{\frac{x^{2}}{6}}-1}{\ln\left(\cos x\right)+\sqrt{1+x^{2}}-1}$

29) $\lim\limits_{x\to 0}\dfrac{e^{-\frac{x^{2}}{2}}-\sqrt[4]{\cos 2x}.ch\left(x^{3}\right)}{\ln^{2}\left(\cos 2x\right)}$

30) $\lim\limits_{x\to 0}\dfrac{e^{x^2}\cos x - chx}{x^5 + x^3\sin^3 x}$

31) $\lim\limits_{x\to 0}\dfrac{e^{x^2}\cos x - chx + x^5}{x^6 + x^2\sin^3 x}$

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

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

34) $\lim\limits_{n\to\infty}\underbrace{\sin(\sin(\ldots\sin x)\ldots)}_{n\ times} = 0\ ,\ x\in\mathbb{R}$

35) $\lim\limits_{n\to\infty}\underbrace{\sin(\sin(\ldots\sin n)\ldots)}_{n\ times} = 0$

36) $\lim\limits_{n\to\infty}\dfrac{1}{n}\underbrace{\left(n!+\left(n!+\cdots+\left(n!\right)^{\frac{1}{n}}\cdots\right)^{\frac{1}{n}}\right)^{\frac{1}{n}}}_{n\ times} = \dfrac{1}{e}$

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

38) $a_1, a_2, a_3, \ldots, a_k > 0$

ก. $\lim\limits_{n\to\infty}\left(\dfrac{a_1^{-n}+a_2^{-n}+\cdots+a_k^{-n}}{k}\right)^{\frac{1}{n}} = \min\left\{a_1, a_2, a_3, \ldots, a_k\right\}$

ข. $\lim\limits_{n\to\infty}\left(\dfrac{a_1^{n}+a_2^{n}+\cdots+a_k^{n}}{k}\right)^{\frac{1}{n}} = \max\left\{a_1, a_2, a_3, \ldots, a_k\right\}$

39) $\lim\limits_{x\to 0}\dfrac{\left(1+x\right)^{15}-\left(1-x\right)^{15}}{\left(1+x\right)^{9}-\left(1-x\right)^{9}}=\dfrac{5}{3}$

40) $\lim\limits_{x\to 0}\dfrac{\left(1+\tan^{2}x\right)^{\ln\sqrt{\frac{2\tan x}{\sin 2x}}}-1}{x^{4}}=\dfrac{1}{5}$

41) $\lim\limits_{x\to 0}\left(1+x\right)^{\frac{\tan(\sin x)-\sin(\sin x)}{x^{4}}}=e^{\frac{1}{2}}$

42) $\lim\limits_{x\to 0}\left(1+\csc x-\cot x\right)^{\frac{x\cos\left(\frac{x}{2}\right)-2}{x^{3}}}=e^{-\frac{1}{12}}$

43) $\lim\limits_{n\to\infty}\left\{\dfrac{n}{p-1}-\left[\left(\dfrac{n}{n+1}\right)^{p}+\left(\dfrac{n}{n+2}\right)^{p}+\cdots\right]\right\},\left(p>1\right)=\dfrac{1}{2}$

44) $\lim\limits_{n\to\infty}\dfrac{1^{\alpha-1}-2^{\alpha-1}+3^{\alpha-1}-4^{\alpha-1}+\cdots+\left(-1\right)^{n-1}n^{\alpha-1}}{n^{\alpha}},\left(\alpha>0\right)=0$

45) $\lim\limits_{x\to 0}\left(x!\right)^{\frac{1}{x}}=e^{-\gamma}$

46) $\lim\limits_{x\to\frac{\pi}{2}}\dfrac{1-\left(\sin x\right)^{m+n+p}}{\sqrt[3]{\left(1-\sin^{m}x\right)\left(1-\sin^{n}x\right)\left(1-\sin^{p}x\right)}},\left(m,n,p\neq 0\right)=\dfrac{m+n+p}{\sqrt[3]{mnp}}$

47) $\lim\limits_{x\to+\infty}\left[\sqrt[n]{\left(x+a_{1}\right)\left(x+a_{2}\right)\times\cdots\times\left(x+a_{n}\right)}-\sqrt[m]{\left(x+b_{1}\right)\left(x+b_{2}\right)\times\cdots\times\left(x+b_{m}\right)}\right]$

ដែល $\left(a_{1},a_{2},\ldots,a_{n},b_{1},b_{2},\ldots,b_{m}\neq 0\right)=\dfrac{1}{n}\sum\limits_{i=1}^{n}a_{i}-\dfrac{1}{m}\sum\limits_{i=1}^{m}b_{i}$

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

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

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

51) $\lim\limits_{x\to 2}\dfrac{\left(x^{2}-6x+8\right)\arctan\left(x^{3}-8\right)+2\ln\left(x^{2}-4x+5\right)+\left(x-2\right)^{3}}{\left(e^{x}-e^{2}\right)\left(2-\sqrt{x+2}\right)+2x^{2}-8x+9-e^{\left(x-2\right)^{4}}}=\dfrac{88}{e^{2}-8}$

52) $\lim\limits_{x\to 0}\dfrac{3x-3\arctan x-x^{3}+x^{4}}{6\ln\left(1-x\right)+6x+3x^{2}+2x^{3}}=-\dfrac{2}{3}$

53) $\lim\limits_{x\to 0}\dfrac{\ln\left|\sin 2x\right|}{\ln\left|\sin 3x\right|}$

54) $\lim\limits_{x\to 0}\dfrac{\int_{0}^{x^{2}}\left(t^{2}+3t+2\right)\left(\cos t-1\right)\sin 2t\,dt}{x^{12}}$

55) $\lim\limits_{x\to 0}\dfrac{\int_{x^{2}}^{0}\left(e^{t}-1\right)^{2}\ln\left(\cos t\right)dt}{x^{10}}$

56) $\lim\limits_{x\to+\infty}\left(\sqrt{x^{2}+x\sqrt{x^{2}+x}}-\sqrt{x^{2}+x\sqrt{x^{2}-x}}\right)$

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

58) $\lim\limits_{x\to 0}\dfrac{\sqrt{1+3\sin x}+\sqrt{1+\tan x}-2}{\sin 2x}$

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

60) $\lim\limits_{x\to 0}\dfrac{\arcsin\left(x^3+\tan^2 3x\right)+2\left(\arcsin x\right)^2}{1-\cos^3 2x+\sin^2 x}$

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

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

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

64) $\lim\limits_{x\to 1}\dfrac{\left(x^3-1\right)\left(x^2-2x+\sin\dfrac{\pi x}{2}\right)+\sin\dfrac{\pi x}{2}-e^{(x-1)^2}}{\left(e^{2x}-e^2\right)\left(x^4-1\right)+\ln^2 x}$

65) $\lim\limits_{x\to -1}\dfrac{(x+1)\ln(x+2)+x^3+4x^2+5x+1+e^{(x+1)^2}}{\left(1+\cos\pi x\right)\left(x^3+1\right)-\sqrt{x^2+2x+2}+1}$

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

67) $\lim\limits_{x\to 0}\dfrac{\left(\operatorname{Arctan} x\right)^2-\tan x.\sin x}{\left(1-\cos x\right)^2}=-\dfrac{10}{3}$

68) $\lim\limits_{x\to 0}\dfrac{\left(\sin x-x\right).\log|x|}{|x|^{\frac{5}{2}}}=0$

69) $\lim\limits_{x\to 0}\dfrac{\sqrt{\sin x}-\sqrt{x}}{\sin\sqrt{x}-\sqrt{x}}=0$

70) $\lim_{x\to 0}\frac{1}{x^2}\left[\frac{\cos\left(x+x^2\right)}{1+x+x^2}-e^{-x}\right]=-1$

71) $\lim_{n\to\infty}\frac{\sqrt{1}\,\operatorname{Arctan}1+\sqrt{2}\,\operatorname{Arctan}2+\cdots+\sqrt{n}\,\operatorname{Arctan}n}{n\sqrt{n}}=\frac{\pi}{3}$

72) $\lim_{x\to 0}\frac{3x-2\sin x-\tan x}{3x-2shx-thx}=1$

73) $\lim_{x\to+\infty}\frac{sh\left(chx\right)}{ch\left(shx\right)}=1$

74) $\lim_{n\to\infty}\frac{\sum_{k=1}^{n}\sin\left(\frac{1}{k}\right)}{\sum_{k=1}^{n}\cos\left(\frac{1}{k}\right)}$

75) $\lim_{n\to\infty}\frac{\left(n+1\right)\ln\left(n!\right)-2\ln\left(\prod_{k=2}^{n}k!\right)}{n^2+n}$

76) $\lim_{n\to\infty}\frac{\sum_{k=1}^{n}\sqrt{k}}{n\sqrt{n}+\left(-1\right)^n n}$

77) $\lim_{n\to\infty}\frac{1}{n^{m+1}}\sum_{k=1}^{n}\frac{\left(k+m\right)!}{k!}$, $m\in\mathbb{N}$

78) $\lim_{n\to\infty}\frac{\sum_{k=1}^{n}k\sqrt{k}+\left(-1\right)^n n}{n^2.\sqrt{n}+\left(-1\right)^{n+1}.\left(n+1\right)^2}$

79) $\lim_{n\to\infty}\frac{\left(\sin x\right)^{2n+2}+\left(\cos x\right)^{2n+2}}{\left(\sin x\right)^{2n}+\left(\cos x\right)^{2n}}$

80) $\lim\limits_{n\to\infty}\dfrac{\ln\left[\left(\dfrac{1}{x}\right)^n+3^n\right]}{\ln\left[x^n+\left(\dfrac{1}{3}\right)^n\right]}\ ,\ x>0$

81) $\lim\limits_{n\to\infty}\sqrt[n]{\dfrac{x^{2n}+3^n+\dfrac{1}{(2x)^n}}{x^n+\dfrac{1}{2^n}}}\ \ ,\ \ x>0$

82) $\lim\limits_{n\to\infty}\left(\lim\limits_{m\to\infty}\dfrac{2}{\pi}\arctan\left(m\sin^2\left(\pi x.n!\right)\right)\right)\ ,\ x\in\mathbb{R}$

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

84) $\lim\limits_{x\to0}\dfrac{\tan^2x-\tan x}{x^2-x}$

85) $\lim\limits_{x\to\pi^+}\dfrac{\sin x+2\sqrt{x-\pi}.\tan x}{(\pi-x)\sin\dfrac{x}{2}}$

86) $\lim\limits_{x\to0}\dfrac{\sin\left(x+\dfrac{\pi}{4}\right)-\dfrac{\sqrt{2}}{2}}{\cos\left(x+\dfrac{\pi}{4}\right)-\dfrac{\sqrt{2}}{2}}$

87) $\lim\limits_{x\to0}\dfrac{\tan\left(\sin\left(\tan x\right)\right)}{\tan\left(\tan\left(\sin x\right)\right)}$

88) $\lim\limits_{x\to0}\dfrac{\cos\left(\sin x\right)-\sin\left(\tan^2x\right)-1}{\tan\left(\cos^2x-1\right)}$

89) $\lim\limits_{x\to 0}\dfrac{\cos\left(x\sin x\right)-\cos\left(x\tan x\right)}{\left(1-\cos x\,.\cos 2x\right)\left(1-\cos 3x\right)}$

90) $\lim\limits_{x\to 0}\dfrac{\dfrac{\sin x}{x}-\cos x+\left(1+x\right)^{\frac{5}{4}}-1}{x}$

91) $\lim\limits_{x\to 0}\dfrac{\tan\left(\dfrac{\pi}{4}-\dfrac{\pi}{4}\cos x\right)}{\sin\left(\sqrt{\cos x}\right)-\sin\left(\sqrt[4]{\cos 2x}\right)}$

92) $\lim\limits_{x\to a}\dfrac{x^{x^a}-a^{x^x}}{x-a}$

93) $\lim\limits_{x\to 0}\dfrac{\sin x\,.shx-chx\,.\cos x+e^{x^2}}{\left(4+x^2+x.\sqrt[3]{x}-x^3\right)^{\frac{5}{2}}-32\cos x}$

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

95) $\lim\limits_{x\to 0}\dfrac{\sqrt{1+x\sin x\,.\cos 2x}-\left(x^2-1\right)^2}{e^{\tan\left(x^2\right)}-\cos x}$

96) $\lim\limits_{x\to 0}\dfrac{\sqrt{\cos x}-\sqrt[3]{\cos 3x}\,.\sqrt[4]{\cos 4x}}{\sqrt{chx}-ch3x\,.ch^2 4x}$

97) $\lim\limits_{x\to 0}\dfrac{\sqrt[3]{27+x}-\sqrt[4]{16-x}-e^x}{\ln\left(1+e^x-\cos x\right)}$

98) $\lim\limits_{x\to 0}\dfrac{\cos\left(e^x-\cos x\right)-\ln\left(e+x^2\right)}{\cos x\,.\cos^2 2x\,.\cos^3 3x-\left(1+x^2\right)^{\pi}.\left(1-x^2\right)^e}$

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

100) $\lim\limits_{x\to 0}(1+\cos x)^{(\sin x)^{\tan x}}$

101) $\lim\limits_{x\to 1^+}\left(\dfrac{chx-\cos x}{shx-\sin x}\right)^{\frac{1}{x-1}}$

102) $\lim\limits_{x\to 0}\left[\,16-7\sin x+(5x-3)^3+\cos x+2\cos 2x+3\cos 3x+6^{x+1}\,\right]^{\frac{x}{\sin x+\cos x-e^x}}$

103) $\lim\limits_{x\to 1}\left[\,\log_2\left(2x^2\right)+\log_2 x\,.\,x^{\log_x\left(\log_2 x+1\right)}+\dfrac{1}{2}\log_4^2\left(x^4\right)+2\,\right]^{\frac{1}{x}}$

104) $\lim\limits_{x\to 0}\dfrac{\tan x-thx+\sin\left(sh\left(\sin\left(e^x-\cos x\right)\right)\right)}{\arctan\left(th\left(x^3-x\right)\right)}$

105) $\lim\limits_{x\to 0}\dfrac{\sin x-shx+chx-\cos x}{\sin x\,.\arctan x\,.(1+x)^{\frac{5}{2}}\,.\left[\,1+\ln(1+x)\,\right]}$

106) $\lim\limits_{x\to 0^+}\dfrac{\arcsin x+\sin x+\tan x-(1+x)^{\frac{1}{5}}+e^x}{\left(1+\sqrt{x}\right)^{\sqrt{x}}}$

107) $\lim\limits_{x\to 0}\dfrac{\arctan\left(\sqrt{\cos x}-\sqrt[3]{chx}\right)}{e^x-\ln(1+x)-\left(1+\dfrac{x^2}{4}\right)^{15}}$

108) $\lim\limits_{x\to 0}\dfrac{\ln(1+\cos x)-\cos x}{\ln(1+\sin x)-\sin x}$

109) $\lim\limits_{x\to 0}\dfrac{\sin\left(\cos x\right)-x}{\sin\left(\sin x\right)-x}$

110) $\lim\limits_{x\to 1}\tan\left[\ \arccos x+\sin\left(\dfrac{x-1}{x+1}\right).\cos\left(\dfrac{x+1}{x-1}\right)\ \right]=0$

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

112) $\lim\limits_{x\to 1}\dfrac{x^{1111}+2x^{2222}-3x^{3333}}{x^{4444}-1}=-1$

113) $\lim\limits_{n\to\infty}\dfrac{\left(n+1\right)\sin^{n+1}\left[\ \dfrac{\pi}{\left(n+1\right)^{2}}\ \right]}{n\sin^{n}\left(\dfrac{\pi}{n^{2}}\right)}$

114) $\lim\limits_{x\to\frac{\pi}{2}}\dfrac{\cos\left(\dfrac{x}{2}\right)-\sin\left(\dfrac{x}{2}\right)}{\cos x}$

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

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

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

118) $\lim\limits_{x\to 0}\dfrac{\left[\ \tan\left(\tan x\right)-\sin\left(\sin x\right)\ \right].\left[\ e^{\tan(\tan x)}-e^{\sin(\sin x)}\ \right].\ln\left(\dfrac{x}{\sin x}\right)}{\arctan\left(\arcsin x\right).\left[\ \arctan\left(\arcsin x\right)-\arcsin\left(\arctan x\right)\ \right]}=5$

119) $\lim\limits_{n\to\infty} 2^n.\underbrace{\sqrt{2-\sqrt{2+\sqrt{2+\cdots+\sqrt{2}}}}}_{n\ times} = \pi$

120) $\lim\limits_{n\to\infty} \frac{1}{n}\left(\frac{n}{\frac{1}{2}+\frac{2}{3}+\cdots+\frac{n}{n+1}}\right)^n = e^{\gamma-1}$

121) $\lim\limits_{n\to\infty} e^{-\frac{n}{2}}.\sqrt{n}.\left(\prod\limits_{k=1}^{n} C_n^k\right)^{\frac{1}{n}} = \frac{e}{\sqrt{2\pi}}$

122) $\lim\limits_{n\to\infty}\left[\sum\limits_{k=1}^{n}\arctan\left(\frac{1}{k}\right)-\ln n\right] = \frac{1}{2i}\ln\frac{\Gamma(1-i)}{\Gamma(1+i)} \approx 0.30164$

123) $\lim\limits_{n\to\infty}\frac{\int_0^n \frac{|\sin x|}{x}\,dx}{\ln n} = \frac{2}{\pi}$

124) $\lim\limits_{n\to\infty}\sum\limits_{k=1}^{n^2}\frac{1+2^{\frac{1}{2k}}+3^{\frac{1}{3k}}+\cdots+n^{\frac{1}{nk}}}{n^2+k^2} = \frac{\pi}{2}$

125) $\lim\limits_{n\to\infty}\frac{\int_0^{\frac{\pi}{2}} \frac{\sin^2(nx)}{\sin x}\,dx}{\ln n} = \frac{1}{2}$

126) $\lim\limits_{n\to\infty}\frac{\frac{1}{2\ln 2}+\frac{1}{3\ln 3}+\cdots+\frac{1}{n\ln n}}{\ln\left[\ln\left(2\ln 2+3\ln 3+\cdots+n\ln n\right)\right]} = 1$

127) $\lim\limits_{n\to\infty}\int_0^1 \frac{x\sin(nx)}{1+n^6x^2}\,dx = 0$

128) $\lim\limits_{n\to\infty}\frac{1}{2^n}\sum\limits_{k=1}^{n} C_n^k \sin^2\left(\pi\sqrt{k^2+k}\right) = 1$

129) $\lim\limits_{x\to 0}\left(\dfrac{2+e^{\frac{1}{x}}}{1+e^{\frac{4}{x}}}+\dfrac{\sin x}{|x|}\right)=1$

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

131) $\lim\limits_{n\to\infty}\dfrac{1}{n}\left|\sum\limits_{i=1}^{n}(-1)^{i-1}\,i\right|=\dfrac{1}{2}$

132) $\lim\limits_{n\to\infty} n\{\,n!.e\,\}=1$

133) $\lim\limits_{n\to\infty}\prod\limits_{k=1}^{n-1}\left(\dfrac{2^k}{2^{k+1}-1}\right)^{\frac{1}{2^{n-k}}}=\dfrac{1}{2}$

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

135) $\lim\limits_{x\to 0}\dfrac{\left(\sqrt[10]{1+\tan x}-1\right)\left(\sqrt{1+x}-1\right)}{2x\sin x}=\dfrac{1}{40}$

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

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

138) $\lim\limits_{x\to 2^+}\dfrac{[x]^2-4}{x^2-4}=0$

139) $\lim\limits_{n\to\infty}\left(1+\dfrac{1}{n}\sum\limits_{k=1}^{n}x^k\right)^n,\ (|x|<1)=e^{\frac{x}{1-x}}$

140) $\lim\limits_{x\to a}\left(\dfrac{\sin x}{\sin a}\right)^{\frac{1}{x-a}}$, $\left(a\neq k\pi, k\in\mathbb{Z}\right)=e^{\cot a}$

141) $\lim\limits_{x\to+\infty} x^{\frac{7}{4}}.\left(\sqrt[4]{x+1}+\sqrt[4]{x-1}-2.\sqrt[4]{x}\right)=-\dfrac{3}{16}$

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

143) $\lim\limits_{x\to 1}\dfrac{1-x}{5-x-\sqrt{x}-\sqrt[3]{x}-\sqrt[4]{x}-\sqrt[5]{x}}$

144) $\lim\limits_{x\to 1}\dfrac{\sqrt{\sqrt{x}-1}}{\sqrt[4]{x-1}}=0$

145) $\lim\limits_{x\to 1}\dfrac{x^{2n}-3+2x^{-2n}}{x^{2n}-4+3x^{-2n}}$, $n\neq 0$ $=\dfrac{1}{2}$

146) $\lim\limits_{x\to n}\dfrac{\left[3x\right]-3\left[x\right]}{x-n}$, $n\in\mathbb{Z}$ = គ្មានលីមីត

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

148) $\lim\limits_{x\to 0}\dfrac{2m-\sqrt[2m-1]{x+1}+\sqrt[2m+1]{x-1}}{\sqrt[2m+1]{x+1}+\sqrt[2m-1]{x-1}}$, $m\in\mathbb{N}$

149) $\lim\limits_{\substack{x\to a\\ y\to a}}\dfrac{(x-y)a^m+(a-x)y^m-(a-y)x^m}{(x-y)(a-x)(a-y)}$

150) $\lim\limits_{x\to 2a}\dfrac{x^2-ax-2a^2+2x-4a}{x^2-5ax+6a^2-x+2a}$

151) $\lim\limits_{x\to\infty}\dfrac{\sqrt[5]{x^4.\sqrt[5]{x^4.\sqrt[5]{x^4\ldots}}}}{\sqrt[4]{x^5.\sqrt[4]{x^5.\sqrt[4]{x^5\ldots}}}}$

152) $\lim\limits_{x\to 0}\dfrac{\sin\left(\frac{\pi}{4}+x\right)-\sin\left(\frac{\pi}{4}-x\right)}{\cos\left(\frac{\pi}{4}+x\right)-\cos\left(\frac{\pi}{4}-x\right)}\times\dfrac{2\left(1-\cos x\right)}{x^2}=-1$

153) $\lim\limits_{x\to\frac{\pi}{4}}\dfrac{\cos^2\left(9x-2\pi\right)-\sin^2\left(5x-2\pi\right)}{\cos 2x}$

154) $\lim\limits_{x\to\sqrt{n}}\left(\sqrt[n]{\dfrac{\sqrt{n}}{x-\sqrt{n}}}+1\right).\sqrt[n]{x^2-n}=\sqrt[n]{2n}$

155) $\lim\limits_{x\to+\infty}\dfrac{\left(\ln\left(\ln x\right)\right)^{\left(x^{\ln x}\right)}}{\left(\ln x\right)^{x^{\left(\ln(\ln x)\right)}}}$

156) $\lim\limits_{x\to\frac{\pi}{2}}\dfrac{\operatorname{sgn}\left(\sin 2x\right)}{\operatorname{sgn}\left(\cos 3x\right)}$

157) $\lim\limits_{x\to 0^+}\left(x^{\sqrt{x}}-\sqrt{x}^{\,x}\right)=0$

158) $\lim\limits_{x\to+\infty}\left(x^{\sqrt{x}}-\sqrt{x}^{\,x}\right)=-\infty$

159) $\lim\limits_{x\to+\infty}\dfrac{a^{\left(b^x\right)}}{b^{\left(a^x\right)}}\,,\left(1<a<b\right)=+\infty$

160) $\lim\limits_{x\to\frac{\pi}{4}}\dfrac{\sin x-\cos x}{\ln\left(\sin x\right)-\ln\left(\cos x\right)}$

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

162) $\lim\limits_{x\to 0}\dfrac{\sin\left(\sin x\right)-\sin\left(\sin\left(\sin x\right)\right)}{\sin x\,.\sin\left(\sin x\right).\sin\left(\sin\left(\sin x\right)\right)}=\dfrac{1}{6}$

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

164) $\lim\limits_{x\to 0}\dfrac{\sin x\,.\left[\ \sin x-\sin\left(\sin x\right)\ \right]}{x^{4}}=\dfrac{1}{6}$

165) $\lim\limits_{n\to\infty}n^{2}\times\dfrac{\sqrt[n]{1+n}-\sqrt[n+1]{n}}{\ln\left(1+n\right)}=1$

166) $\lim\limits_{x\to 3}\dfrac{\sin\left(x^{x}\right)-\sin\left(3^{x}\right)}{3^{x^{x}}-3^{3^{x}}}=\dfrac{\cos 9}{3^{9}\ln 3}$

167) $\lim\limits_{x\to\frac{\pi}{2}}\dfrac{a^{\cot x}-a^{\cos x}}{\cot x-\cos x}=\ln a$

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

169) $\lim\limits_{x\to 0^{+}}\dfrac{2x\,.\left(\arcsin x\right)^{2}+\tan x-\sin x}{x^{3}}=2$

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

171) $\lim\limits_{x\to 0}\dfrac{6\sin\left(\sin\left(\sin\left(\sin\left(\sin x\right)\right)\right)\right)-6x+5x^{3}}{x^{5}}$

172) $\lim\limits_{x\to 0}\dfrac{6\tan\left(\pi\sin x\right)-6\pi x-\left(2\pi^3-\pi\right)x^3}{6\left(\sin\left(\pi\left(\sin\left(\pi x\right)\right)\right)\right)-6\pi^2 x+\left(\pi^6+\pi^4\right)x^3}$

173) $\lim\limits_{x\to 0}\dfrac{-24\sin^2\left(\dfrac{\tan\left(\sin\left(e^x-1\right)\right)}{2}\right)+5x^4+6\left(x^3+x^2\right)}{x^5}$

174) $\lim\limits_{x\to 0}\dfrac{48\sin\left(\sin\left(\sin\left(e^{\sin\frac{x}{2}}-1\right)\right)\right)-24x-6x^2+3x^3}{12\left(\sqrt[3]{2x^4+x^3+x^2+1}-\sqrt[3]{x^3+1}\right)-3x^2+x^3}$

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

176) $\lim\limits_{x\to 0}\dfrac{\cos x.\cos 2x.\cos 4x.\cos 8x.\cos 16x-\dfrac{x}{\sin x}}{x^2}=-\dfrac{512}{3}$

177) $\lim\limits_{x\to 0}\dfrac{10^{2x}+10^{-2x}-2}{10^{2x}-10^{-2x}}=0$

178) $\lim\limits_{n\to\infty}\dfrac{2^n}{\sqrt{n!}}=0$

179) $\lim\limits_{x\to\sqrt{10}}\dfrac{\sqrt{7+2x}-\left(\sqrt{5}+\sqrt{2}\right)}{x^2-10}=\dfrac{\sqrt{5}-\sqrt{2}}{6\sqrt{10}}$

180) $\lim\limits_{x\to\sqrt{6}}\dfrac{\sqrt{5+2x}-\left(\sqrt{3}+\sqrt{2}\right)}{x^2-6}=\dfrac{\sqrt{3}-\sqrt{2}}{2\sqrt{6}}$

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

182) $\lim\limits_{x\to 0}\left\{\dfrac{\lambda+\ln\left[\left(1+a_1x\right)\left(1+a_2x\right)\left(1+a_3x\right)\times\cdots\times\left(1+a_nx\right)\right]}{\lambda+\ln\left[\left(1+b_1x\right)\left(1+b_2x\right)\left(1+b_3x\right)\times\cdots\times\left(1+b_nx\right)\right]}\right\}^{\frac{1}{x}}$

ដែល $\lambda\neq 0$ & $a_1,a_2,\ldots,a_n,b_1,b_2,\ldots,b_n>0$

183) $\lim\limits_{n\to\infty}\left[1+\sin\left(\pi\sqrt{2+4n^2}\right)\right]^n=e^{\frac{\pi}{2}}$

184) $\lim\limits_{n\to\infty}\sin\left(\pi\sqrt{2+4n^2}\right)=0$