



សាកលវិទ្យាល័យគ្រប់គ្រងគោលការណ៍

ការណែនាំកិច្ចការ

ឆ្នាំទី១ និង ឆ្នាំទី២

លេខគណនីស្តុតបង់

1111 លំហាត់

ចងក្រងដោយនិស្សិត ស៊ីម សេងតា

២០១៤

គ្រួសារ និង ប្រវត្តិសង្ខេបនៃការសិក្សា



ថ្ងៃ ខែ ឆ្នាំកំណើត : ០៦ កក្កដា ១៩៩៧

ទីកន្លែងកំណើត : ភូមិភ្នំសំពៅលិច ឃុំភ្នំសំពៅ ស្រុកបាណន់ ខេត្តបាត់ដំបង

- **គ្រួសារ**

បងប្អូនប្រុស៣នាក់ ស៊ឹម សេងគា (កូនបង) ស៊ឹម ស៊ាវហុង និង ស៊ឹម ស៊ាវហាង (កូនពៅ)

ម្តាយឈ្មោះ ច័ង្គ លាងហេង

ឪពុកឈ្មោះ យ៉ាន់ ស៊ឹម

- **ប្រវត្តិសង្ខេបនៃការសិក្សា**

ឆ្នាំ ២០០៣ ដល់ ២០០៩ រៀននៅសាលាបឋមសិក្សាសម្តេចឪ - សម្តេចម៉ែភ្នំសំពៅ

ឆ្នាំ ២០០៩ ដល់ ២០១២ រៀននៅវិទ្យាល័យហ៊ុនសែនភ្នំសំពៅ

ឆ្នាំ ២០១២ ដល់ ២០១៥ រៀននៅវិទ្យាល័យព្រះមុនីវង្ស

ឆ្នាំ ២០១៥ ដល់ ២០១៩ រៀននៅសាកលវិទ្យាល័យភូមិន្ទភ្នំពេញ (ឯកទេសគណិតវិទ្យា)

- **លេខទូរស័ព្ទ និង Facebook សម្រាប់ទំនាក់ទំនង**

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ចូរគណនាលីមីតខាងក្រោម ៖

1.
$$\lim_{x \rightarrow 0^+} \frac{(\sqrt{x})^{\sqrt{x}} - x^x}{(\sqrt{x})^x - x^{\sqrt{x}}}$$
2.
$$\lim_{n \rightarrow \infty} \left\{ n \sqrt[n]{\lim_{x \rightarrow 0} \frac{(e^x - \cos x)(e^{2x} - \cos 2x) \times \cdots \times (e^{nx} - \cos nx) - n! \times x^n}{\sin^{n+1}[(n+1)x]}} \right\}$$
3.
$$\lim_{n \rightarrow \infty} \sum_{k=1}^n \left(\sqrt[m]{1 + \frac{k^{m-1}}{n^m}} - 1 \right), \quad m \in \mathbb{N}^*$$
4.
$$\lim_{x \rightarrow \infty} \left[\log \left(x^{\frac{1}{a^x} + \frac{1}{b^x} + \frac{1}{c^x}} \right) \right]^{\frac{1}{x}}, \quad a, b, c > 1$$
5.
$$\lim_{n \rightarrow \infty} \left[\sum_{k=1}^n \frac{k}{(k+1)!} \right] \times \left\{ \sum_{k=1}^n \frac{k(k+2)}{[(k+1)!]^2} \right\} \times \left\{ \sum_{k=1}^n \frac{k(k^2+3k+3)}{[(k+1)!]^3} \right\}$$
6.
$$\lim_{n \rightarrow \infty} \left[\frac{(n+1)^2}{\sqrt[2n+2]{(2n+1)!! \times (n+1)!!}} - \frac{n^2}{\sqrt[2n]{(2n-1)!! \times n!}} \right]$$
7.
$$\lim_{n \rightarrow \infty} n \left[\sqrt[2n+2]{(2n+1)!!} - \sqrt[2n]{(2n-1)!!} \right] \left[\sqrt[2n+2]{(n+1)!} - \sqrt[2n]{n!} \right]$$
8.
$$\lim_{n \rightarrow \infty} \frac{\sqrt[3]{\left(1 + \frac{1}{\sqrt[5]{2}} + \frac{1}{\sqrt[5]{3}} + \cdots + \frac{1}{\sqrt[5]{n}}\right)^2}}{\sqrt[5]{\left(1 + \frac{1}{\sqrt[3]{2}} + \frac{1}{\sqrt[3]{3}} + \cdots + \frac{1}{\sqrt[3]{n}}\right)^4}}$$
9.
$$\lim_{n \rightarrow \infty} n^{\frac{m-1}{m}} \left[\sqrt[mn+m]{(2n+1)!!} - \sqrt[mn]{(2n-1)!!} \right]$$
10.
$$\lim_{n \rightarrow \infty} \frac{\sqrt[n]{\sqrt{2!}} \times \sqrt[3]{3!} \times \cdots \times \sqrt[n]{n!}}{\sqrt[n+1]{(2n+1)!!}}$$

11.
$$\lim_{x \rightarrow 0} \frac{\frac{\cos x}{\cos 2x} + \frac{\cos 2x}{\cos 3x} + \dots + \frac{\cos nx}{\cos[(n+1)x]} - n}{x^2}$$
12.
$$\lim_{x \rightarrow e} \frac{\ln x + \ln^2 x + \dots + \ln^n x - n}{x - e}$$
13.
$$\lim_{x \rightarrow 0} \frac{\cos x \times \cos 3x \times \dots \times \cos[(2n-1)x] - \cos 2x \times \cos 4x \times \dots \times \cos 2nx}{x^2}$$
14.
$$\lim_{x \rightarrow 0} \frac{2^{\cos x} + 3^{\cos 2x} + \dots + n^{\cos nx} - \frac{n(n-1)}{2}}{x^2}$$
15.
$$\lim_{x \rightarrow 0} \frac{\sin(a+x) \times \sin^2(a+2x) \times \dots \times \sin^n(a+nx) - (\sin a)^{\frac{n(n+1)}{2}}}{\cos(a+x) \times \cos^2(a+2x) \times \dots \times \cos^n(a+nx) - (\cos a)^{\frac{n(n+1)}{2}}}$$
16.
$$\lim_{x \rightarrow 0} \frac{\sin(a+x) \times \sin(a+2x) \times \dots \times \sin(a+nx) - \sin^n a}{\ln(a+x) \times \ln(a+2x) \times \dots \times \ln(a+nx) - \ln^n a}$$
17.
$$\lim_{n \rightarrow +\infty} \frac{1}{n} \prod_{k=1}^n (a+k)^{\frac{1}{n}}$$
18.
$$\lim_{n \rightarrow +\infty} \frac{1}{n} \prod_{k=1}^n (2n+k)^{\frac{1}{n}}$$
19.
$$\lim_{n \rightarrow +\infty} \sum_{k=1}^n \left[\frac{2k+1}{2^k \times (k+1)!} \right]$$
20.
$$\lim_{n \rightarrow +\infty} \frac{1}{n} \sum_{k=1}^{n-1} \left(a + \frac{k}{n} \right)^2$$
21.
$$\lim_{n \rightarrow +\infty} \prod_{k=0}^n \left(\frac{2k^2 + k - 1}{2k^2 + k} \right)$$
22.
$$\lim_{n \rightarrow +\infty} \prod_{k=0}^n \left(\frac{2^k + 1}{2^k + 2} \right)$$
23.
$$\lim_{n \rightarrow +\infty} \sum_{k=1}^n \left(\frac{k}{k^4 + k^2 + 1} \right)$$

$$24. \quad \lim_{n \rightarrow +\infty} n \prod_{k=1}^n \left[\sum_{j=1}^k \left(\frac{1}{j^2 + j} \right) \right]$$

$$25. \quad \lim_{n \rightarrow +\infty} \sum_{k=1}^n \frac{k^3 + 6k^2 + 11k + 5}{(k+3)!}$$

$$26. \quad \lim_{n \rightarrow +\infty} \sum_{k=1}^n \frac{k^3 + 6k^2 + 6k + 2}{2^k k^3 (k+1)^3}$$

$$27. \quad \lim_{n \rightarrow +\infty} \sum_{k=1}^n \left[\sum_{j=1}^k \left(\frac{j}{n^3} \right) \right]$$

$$28. \quad \lim_{x \rightarrow 1} \frac{x^{x^x+1} - x^{x^x} + x - 1}{x - 1}$$

$$29. \quad \lim_{x \rightarrow 0} \left(\frac{1^x + 2^x + \dots + n^x}{n} \right)^{\frac{a}{x}}$$

$$30. \quad \lim_{t \rightarrow +\infty} \left[\int_0^t \frac{4x-2}{(x+2)(x^2+1)} dx \right], \quad t > 0$$

$$31. \quad \lim_{n \rightarrow +\infty} \left(\int_1^e \frac{\ln^n x}{x} dx \right)$$

$$32. \quad \lim_{n \rightarrow +\infty} \left(\int_0^1 x^n \sin \pi x \, dx \right)$$

$$33. \quad \lim_{n \rightarrow +\infty} \left(\int_0^1 \frac{x^n}{1+x} \, dx \right)$$

$$34. \quad \lim_{x \rightarrow 0} \frac{\int_0^x \sin^2 at \, dt}{x^3}$$

$$35. \quad \lim_{x \rightarrow 0} \frac{\int_0^{x^2} (1 - \cos t) \, dt}{x^4}$$

$$36. \quad \lim_{x \rightarrow +\infty} \frac{2x \int_0^x e^{t^2} \, dt}{e^{x^2}}$$

$$37. \quad \lim_{x \rightarrow +\infty} \frac{\left(\int_0^x e^{t^2} dt \right)^2}{\int_0^x e^{2t^2} dt}$$

$$38. \quad \lim_{x \rightarrow +\infty} \frac{\int_0^x (\operatorname{Arc} \tan t)^2 dt}{\sqrt{x^2 + 1}}$$

$$39. \quad \lim_{x \rightarrow 0^+} \frac{\int_0^{\sin x} \sqrt{\tan t} dt}{\int_0^{\tan x} \sqrt{\sin t} dt}$$

$$40. \quad \lim_{x \rightarrow 0} \frac{\int_0^x t \cos t^2 dt}{x^2}$$

$$41. \quad \lim_{x \rightarrow 1} \frac{1 - (n+1)x^n + nx^{n+1}}{(x^n - 1)^2}$$

$$42. \quad \lim_{x \rightarrow a} \frac{x^n - a^n - na^{n-1} \cdot (x - a)}{(x - a)^2}$$

$$43. \quad \lim_{x \rightarrow 1} \frac{x^{n+1} - (n+1)x + n}{(x^3 - 1)^2}$$

$$44. \quad \lim_{x \rightarrow 0} \frac{(x+a)^n - a^n}{(x+b)^m - b^m}$$

$$45. \quad \lim_{x \rightarrow 0} \frac{(x+1)^n - (1+nx)}{(x+1)^m - (1+mx)}$$

$$46. \quad \lim_{x \rightarrow -1} \frac{x^{2n+1} + 1}{x^{2m+1} + 1}$$

$$47. \quad \lim_{x \rightarrow \sqrt{2}} \frac{2x^3 - (4\sqrt{2} + 1)x^2 + (4 + 2\sqrt{2})x - 2}{x^3 - (2\sqrt{2} + 1)x^2 + (2 + 2\sqrt{2})x - 2}$$

$$48. \quad \lim_{x \rightarrow 1} \frac{mx^3 + (1-m)x^2 - (4m+3)x + 4m+2}{x^3 - 3x^2 + 2x}$$

49. $\lim_{x \rightarrow 0} \frac{2^n - (1 + a_1^x)(1 + a_2^x) \times \cdots \times (1 + a_n^x)}{x}$
50. $\lim_{x \rightarrow 0} \left[x \cos \left(\frac{x}{x^2 + 1} \right) \right]^{\frac{x}{x^2 + 1}}$
51. $\lim_{x \rightarrow +\infty} \left[\tan \left(\frac{\pi x + 4}{2x + 3} \right) \right]^{\frac{1}{x}}$
52. $\lim_{x \rightarrow \infty} (x + 2^x)^{\frac{1}{x}}$
53. $\lim_{n \rightarrow \infty} n \left(\frac{1}{3n^2 + 4n + 1} + \frac{1}{3n^2 + 8n + 4} + \cdots + \frac{1}{3n^2 + 4n \times n + n^2} \right)$
54. $\lim_{n \rightarrow \infty} \frac{1}{n^3} \left(\sqrt{n^2 + 1} + 2\sqrt{n^2 + 2^2} + \cdots + n\sqrt{n^2 + n^2} \right)$
55. $\lim_{n \rightarrow \infty} \frac{1}{n^2} \left(\sqrt{n^2 + 1} + \sqrt{n^2 + 2^2} + \cdots + \sqrt{n^2 + n^2} \right)$
56. $\lim_{n \rightarrow \infty} \frac{1}{n} \left(\sqrt{1 + \frac{1}{n}} + \sqrt{1 + \frac{2}{n}} + \cdots + \sqrt{1 + \frac{n}{n}} \right)$
57. $\lim_{n \rightarrow \infty} \left(\frac{2^{\frac{1}{n}}}{n+1} + \frac{2^{\frac{2}{n}}}{n+\frac{1}{2}} + \cdots + \frac{2^{\frac{n}{n}}}{n+\frac{1}{n}} \right)$
58. $\lim_{n \rightarrow \infty} \frac{\pi}{2n} \left[1 + \cos \frac{\pi}{2n} + \cos \frac{2\pi}{2n} + \cdots + \cos \frac{(n-1)\pi}{2n} \right]$
59. $\lim_{n \rightarrow \infty} \left[\sin \frac{\pi}{n} \times \sin \frac{2\pi}{n} \times \cdots \times \sin \frac{(n-1)\pi}{n} \right]^{\frac{1}{n}}$
60. $\lim_{n \rightarrow \infty} \frac{1}{n} \left(e^{\frac{1}{n}} + e^{\frac{2}{n}} + \cdots + e^{\frac{n}{n}} \right)$
61. $\lim_{n \rightarrow \infty} \frac{1}{n} \times \ln \left(\frac{n!}{n^n} \right)$

$$62. \quad \lim_{x \rightarrow 0} x \left(\sin \frac{1}{x} - \frac{1}{\sin x} \right)$$

$$63. \quad \lim_{x \rightarrow 0} x \sin \frac{1}{x}$$

$$64. \quad \lim_{x \rightarrow \frac{\pi}{4}} \frac{1 - \sqrt{2} \cos x}{1 - \sqrt{2} \sin x}$$

$$65. \quad \lim_{n \rightarrow +\infty} \left(\frac{1}{4 \cos^2 \frac{a}{2}} + \frac{1}{4^2 \cos^2 \frac{a}{2^2}} + \cdots + \frac{1}{4^n \cos^2 \frac{a}{2^n}} \right)$$

$$66. \quad \lim_{n \rightarrow +\infty} \frac{3! \times n! \times C_{n+3}^n + n! \times C_{n+1}^n}{3! \times n! \times C_{n+3}^n - n! \times C_{n+1}^n}$$

$$67. \quad \lim_{n \rightarrow +\infty} \left(\frac{1}{1+n^2} + \frac{2}{2+n^2} + \cdots + \frac{n}{n+n^2} \right)$$

$$68. \quad \lim_{n \rightarrow \infty} \left(\sqrt{2} - \sqrt[3]{2} \right) \left(\sqrt{2} - \sqrt[5]{2} \right) \times \cdots \times \left(\sqrt{2} - \sqrt[2n+1]{2} \right)$$

$$69. \quad \lim_{n \rightarrow +\infty} \left(2^n \times \sqrt[n \text{ roots}]{2 - \sqrt{2 + \sqrt{2 + \cdots + \sqrt{2}}}} \right)$$

$$70. \quad \lim_{x \rightarrow a} \frac{\sqrt{x} - \sqrt{a} + \sqrt{x-a}}{\sqrt{x^2 - a^2}}$$

$$71. \quad \lim_{x \rightarrow +\infty} \frac{\ln(x^4 - x^2 + 1)}{\ln(x^8 + x + 2)}$$

$$72. \quad \lim_{x \rightarrow 1} \left(\log_2 |x^2 - 3x + 2| - \log_2 |x^2 - 4x + 3| \right)$$

$$73. \quad \lim_{x \rightarrow \frac{\pi}{3}} \frac{\frac{x}{2} - \frac{\pi}{3} \cos x}{x - \frac{\pi}{3}}$$

$$74. \quad \lim_{x \rightarrow +\infty} x^2 \left(1 - \cos \frac{1}{x} \right)$$

$$75. \quad \lim_{x \rightarrow \frac{\pi}{2}} \left(x \tan x - \frac{\pi}{2 \cos x} \right)$$

$$76. \quad \lim_{n \rightarrow +\infty} \frac{1 + a + a^2 + \dots + a^n}{1 + b + b^2 + \dots + b^n}, \quad |a| < 1, |b| < 1$$

$$77. \quad \lim_{x \rightarrow +\infty} x \left(\sqrt{1 - \frac{1}{x}} - 1 \right)$$

$$78. \quad \lim_{x \rightarrow 0} \frac{2e^x - x^2 - 2x - 2}{x - \sin x}$$

$$79. \quad \lim_{n \rightarrow +\infty} \frac{1 + \sqrt[7]{2} + \sqrt[7]{3} + \dots + \sqrt[7]{n}}{\sqrt[7]{n^9}}$$

$$80. \quad \lim_{n \rightarrow +\infty} \sum_{k=1}^n \frac{5 \cdot 6^k - 4 \cdot 5^k}{(6^{k+1} - 5^{k+1})(6^k - 5^k)}$$

$$81. \quad \lim_{x \rightarrow 0} \left[\frac{\ln(1+x)^{1+x}}{x^2} - \frac{1}{x} \right]$$

$$82. \quad \lim_{n \rightarrow +\infty} \underbrace{\sqrt{1 + \sqrt{1 + \sqrt{1 + \dots + \sqrt{1 + \sqrt{1}}}}}}_{n \text{ roots}}$$

$$83. \quad \lim_{n \rightarrow +\infty} \left[\frac{6}{(3^2 - 2^2)(3 - 2)} + \frac{6^2}{(3^3 - 2^3)(3^2 - 2^2)} + \dots + \frac{6^n}{(3^{n+1} - 2^{n+1})(3^n - 2^n)} \right]$$

$$84. \quad \lim_{n \rightarrow \infty} \frac{1}{n} \left(\sqrt[n]{2} + \sqrt[n]{4} + \dots + \sqrt[n]{2^n} \right)$$

$$85. \quad \lim_{n \rightarrow \infty} \frac{2 \cdot 1^2 + 3 \cdot 2^2 + \dots + (n+1) \cdot n^2}{n^4}$$

$$86. \quad \lim_{n \rightarrow +\infty} \left(\sin \frac{1}{n} + \sin \frac{2}{n^2} + \dots + \sin \frac{n}{n^2} \right)$$

$$87. \quad \lim_{n \rightarrow +\infty} \left(\frac{2}{3} + \frac{4}{9} + \dots + \frac{2^n}{3^n} \right)$$

$$88. \quad \lim_{x \rightarrow 1} \frac{\sqrt{x + 3x^2 + \dots + (2n-1)x^n} - n}{x-1}$$

$$89. \quad \lim_{x \rightarrow 0} \frac{e^x (x-2) + x + 2}{x^3}$$

$$90. \quad \lim_{x \rightarrow 0} \frac{(1+mx)^{nx} - (1+nx)^{mx}}{x^2}, \quad (m,n) \in (\mathbb{N}^*)^2$$

$$91. \quad \lim_{x \rightarrow +\infty} \left[\frac{x}{x+1} + \frac{x^2}{(x+1)(x^2+1)} + \dots + \frac{x^{2^n}}{(x+1)(x^2+1) \times \dots \times (x^{2^n}+1)} \right]$$

$$92. \quad \lim_{n \rightarrow +\infty} \left(\frac{1}{n+\frac{2}{3}} + \frac{1}{n+\frac{8}{3}} + \dots + \frac{1}{n+\frac{6n-4}{3}} \right)$$

$$93. \quad \lim_{n \rightarrow +\infty} \frac{\pi^2}{n^2} \left(\frac{\sin \frac{\pi}{n}}{1 + \cos^2 \frac{\pi}{n}} + \frac{2 \sin \frac{2\pi}{n}}{1 + \cos^2 \frac{2\pi}{n}} + \dots + \frac{n \sin \frac{n\pi}{n}}{1 + \cos^2 \frac{n\pi}{n}} \right)$$

$$94. \quad \lim_{n \rightarrow +\infty} \sqrt[n]{\left(1 + \frac{1}{n}\right) \left(1 + \frac{2}{n}\right) \times \dots \times \left(1 + \frac{n}{n}\right)}$$

$$95. \quad \lim_{n \rightarrow +\infty} \left(\frac{1}{\sqrt{4n^2-1}} + \frac{1}{\sqrt{4n^2-4}} + \dots + \frac{1}{\sqrt{4n^2-n^2}} \right)$$

$$96. \quad \lim_{n \rightarrow +\infty} \frac{2 \times 4 \times 6 \times \dots \times 2n}{3 \times 5 \times 7 \times \dots \times (2n-1)} \times \frac{1}{\sqrt{2n+1}}$$

$$97. \quad \lim_{x \rightarrow +\infty} \frac{\cos\left(\frac{\pi x - 4}{2x - 3}\right)}{1 - e^{\frac{1}{x}}}$$

$$98. \quad \lim_{x \rightarrow a} \frac{x\sqrt{x} - a\sqrt{a}}{\sqrt{\tan x} - \sqrt{\tan a}}$$

$$99. \quad \lim_{x \rightarrow 0} \frac{e^{\alpha x} - \cos \alpha x}{e^{\beta x} - \cos \beta x}$$

$$100. \quad \lim_{x \rightarrow a} \frac{x^x - a^a}{x^a - a^x}, \quad a > 0$$

$$101. \quad \lim_{x \rightarrow a} \frac{a \sin x - x \sin a}{a \cos x - x \cos a}$$

$$102. \quad \lim_{x \rightarrow 0} \frac{\sqrt[n]{\cos \alpha x} - \sqrt[n]{\cos \beta x}}{x^2}$$

$$103. \quad \lim_{x \rightarrow 0} \frac{\cot(a+2x) - 2\cot(a+x) + \cot a}{x^2}$$

$$104. \quad \lim_{x \rightarrow 0} \frac{\cos(a+2x) - 2\cos(a+x) + \cos a}{x^2}$$

$$105. \quad \lim_{n \rightarrow \infty} \frac{1 + \frac{1}{2} + \frac{1}{4} + \dots + \frac{1}{2^n}}{1 + \frac{1}{3} + \frac{1}{9} + \dots + \frac{1}{3^n}}$$

$$106. \quad \lim_{n \rightarrow +\infty} \ln \left[\frac{\sqrt[n]{\frac{(4n)!}{(3n)!}}}{n} \right]$$

$$107. \quad \lim_{x \rightarrow 0} \frac{1 - (1+x)(1+2x) \times \dots \times (1+nx)}{x}$$

$$108. \quad \lim_{x \rightarrow 1} \left[\frac{x + 2x^2 + \dots + nx^n}{x-1} - \frac{n(n+1)}{2x-2} \right]$$

$$109. \quad \lim_{x \rightarrow 1} \frac{(1-\sqrt{x})(1-\sqrt[3]{x}) \times \dots \times (1-\sqrt[n]{x})}{(1-x)^{n-1}}, \quad n \geq 2$$

$$110. \quad \lim_{x \rightarrow 1} \left[\frac{n}{1-x} - \left(\frac{1}{1-x} + \frac{2}{1-x^2} + \dots + \frac{n}{1-x^n} \right) \right]$$

$$111. \quad \lim_{n \rightarrow \infty} \left[(n+1) \times \sqrt[5n+5]{(5n+5) \cos \frac{\pi}{n+1}} - n \times \sqrt[5n]{5n \cos \frac{\pi}{n}} \right]$$

$$112. \quad \lim_{n \rightarrow \infty} \frac{1 + \frac{1}{2} + \frac{1}{3} + \dots + \frac{1}{2^n - 1}}{e^n}$$

$$113. \quad \lim_{n \rightarrow \infty} \left(\frac{n-1}{n^n} \sum_{k=1}^{n-1} k^k \right)$$

$$114. \quad \lim_{n \rightarrow \infty} \left(n \int_{2\pi}^{4\pi} \frac{\sin nx}{x} dx \right)$$

$$115. \quad \lim_{p \rightarrow 0} \left\{ \frac{1}{p} \left[\sum_{k=1}^{\infty} \frac{1}{k(k+1)(k+2) \times \dots \times (k+p)} \right]^{-1} \right\}^{\frac{1}{2018p}}$$

$$116. \quad \lim_{n \rightarrow \infty} \sum_{k=1}^n \left[\sum_{i=1}^k i(3i+1) \right]^{-1}$$

$$117. \quad \lim_{n \rightarrow \infty} n \left[\sum_{k=1}^n \log \left(\frac{2n+2k+1}{n+k} \right) - n \log 2 - \frac{\log 2}{2} \right]$$

$$118. \quad \lim_{n \rightarrow \infty} \left\{ (4n+3) \int_{\frac{\pi}{2}}^{\frac{5\pi}{2}} \frac{\cos[(4n+3)x]}{x^2} dx \right\}$$

$$119. \quad \lim_{\substack{t \rightarrow 1 \\ t > 1}} \left[\frac{1}{t-1} \int_{\sqrt{t}}^t \sqrt{\frac{\text{Arc sin } x}{x}} dx \right]$$

$$120. \quad \lim_{\substack{\varepsilon \rightarrow 0 \\ \varepsilon > 0}} \int_{\varepsilon}^{1-\varepsilon} \frac{(1-x^2) \log x}{1-x^6} dx$$

$$121. \quad \lim_{m \rightarrow \infty} \left(\frac{1}{m} \sum_{i_1=1}^m \sum_{i_2=1}^m \dots \sum_{i_n=1}^m \frac{i_1 + i_2 + \dots + i_n}{i_1^2 + i_2^2 + \dots + i_n^2} \right)$$

$$122. \quad \lim_{n \rightarrow \infty} \left(\frac{1}{n} \sum_{i=1}^n \sum_{j=1}^n \frac{i+j}{i^2 + j^2} \right)$$

$$123. \quad \lim_{n \rightarrow \infty} \sum_{k=1}^{\infty} \left[\frac{\prod_{j=1}^k (n+j)}{(k+2)!} \right]$$

$$124. \quad \lim_{n \rightarrow \infty} \frac{\int_0^1 \left(\frac{2x}{1+x^2} \right)^{n+1} dx}{\int_0^1 \left(\frac{2x}{1+x^2} \right)^n dx}$$

$$125. \quad \lim_{n \rightarrow \infty} n \int_0^{\frac{\pi}{2}} \left[1 - (\sin x)^{\frac{1}{n}} \right] dx$$

$$126. \quad \lim_{n \rightarrow \infty} \sqrt[n]{\int_0^1 (1+x^n)^n dx}$$

$$127. \quad \lim_{n \rightarrow \infty} \sqrt[4]{n} \left[\frac{n+1}{(n+1)^4 \sqrt[n+1]{\prod_{k=1}^{n+1} k^{k^3}}} - \frac{n}{n^4 \sqrt[n]{\prod_{k=1}^n k^{k^3}}} \right]$$

$$128. \quad \lim_{n \rightarrow \infty} \left[{}^{n+1}\sqrt{(n+1)!} - {}^n\sqrt{n!} \right]$$

$$129. \quad \lim_{n \rightarrow \infty} \frac{1}{n^3} \sum_{i=1}^n \sum_{j=1}^n \left[(i+j) e^{\frac{i+j}{n}} \right]$$

$$130. \quad \lim_{x \rightarrow \infty} \left[\sum_{n=1}^{\infty} \left(\frac{x}{n} \right)^n \right]^{\frac{1}{x}}$$

$$131. \quad \lim_{n \rightarrow \infty} \left(\sqrt{4 + \frac{1}{n^2}} + \sqrt{4 + \frac{2}{n^2}} + \cdots + \sqrt{4 + \frac{n}{n^2}} - 2n \right)$$

$$132. \quad \lim_{n \rightarrow \infty} \frac{1}{2n} \ln \left(C_{2n}^n \right)$$

$$133. \quad \lim_{n \rightarrow \infty} \frac{1}{n^5} \sum_{i=1}^n \sum_{j=1}^n \sum_{k=1}^n \left[(i^2 + j^2 + k^2) e^{\frac{i+j+k}{n}} \right]$$

$$134. \quad \lim_{n \rightarrow \infty} \int_0^1 n \log \left[1 + \left(\frac{x}{n} \right)^\alpha \right] dx, \quad 0 < \alpha \leq 1$$

$$135. \quad \lim_{n \rightarrow \infty} \sqrt[n^2+n]{C_n^0 \times C_n^1 \times \dots \times C_n^n}$$

$$136. \quad \lim_{n \rightarrow \infty} \frac{(2n)! \times \sqrt{n}}{(n!)^2 \times 4^n}$$

$$137. \quad \lim_{n \rightarrow +\infty} \left[(n+1) \times (n-1)! \times \left(\sqrt[n!]{99!} - \sqrt[(n+1)!]{99!} \right) \right]$$

$$138. \quad \lim_{x \rightarrow 0} \frac{\cos(\tan x) - \cos x}{x^4}$$

$$139. \quad \lim_{n \rightarrow \infty} \sum_{k=1}^n \left(\frac{\sqrt{C_{n+k}^2}}{n^2} \right)$$

$$140. \quad \lim_{n \rightarrow \infty} \frac{\sqrt[n]{(n+1) \times (n+2) \times \dots \times (n+n)}}{n}$$

$$141. \quad \lim_{x \rightarrow 0} \frac{\tan(e^x - 1) - \ln(\sin x + 1)}{\sqrt[3]{x^2 + 1} - 1}$$

$$142. \quad \lim_{n \rightarrow +\infty} \sqrt[n]{2019^n + 2018^n + 2017^n}$$

$$143. \quad \lim_{x \rightarrow \infty} \left(\frac{1}{\sin x} + \frac{1}{\cos x} \right)^x$$

$$144. \quad \lim_{n \rightarrow \infty} \frac{(1^2 + 2^2 + \dots + n^2)(1^3 + 2^3 + \dots + n^3)}{1^6 + 2^6 + \dots + n^6}$$

$$145. \quad \lim_{n \rightarrow \infty} \sum_{i=1}^n \sum_{j=1}^n \left[\frac{\ln\left(\frac{i}{j}\right)}{(n-i)(n-j)} \right]$$

$$146. \quad \lim_{n \rightarrow \infty} \frac{1}{\sqrt{n}} \int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \sqrt{1 + n \sin^2 x} dx$$

$$147. \quad \lim_{n \rightarrow \infty} \frac{1}{n^4} \sum_{i=1}^n \sum_{j=1}^n \left[i \times j \times \sin\left(\frac{i+j}{n}\right) \sin\left(\frac{i-j}{n}\right) \right]$$

$$148. \quad \lim_{n \rightarrow \infty} \frac{(n!)^2 \times (n+1)^{2n^2+2}}{2n^{2n^2+3n+1}}$$

$$149. \quad \lim_{n \rightarrow \infty} \frac{1 \times 3 \times 5 \times \dots \times (2n-1)}{2 \times 4 \times 6 \times \dots \times 2n}$$

$$150. \quad \lim_{n \rightarrow \infty} \left(\frac{1^m}{n^{m+1}} + \frac{2^m}{n^{m+1}} + \dots + \frac{n^m}{n^{m+1}} \right)$$

$$151. \quad \lim_{n \rightarrow \infty} \frac{1}{n} \log \left[\prod_{k=1}^n \left(\frac{k+n}{n} \right) \right]$$

$$152. \quad \lim_{n \rightarrow \infty} \left[\frac{2+4+6+\dots+2n}{1+3+5+\dots+(2n-1)} \right]^n$$

$$153. \quad \lim_{n \rightarrow \infty} \frac{1 + {}^{2^2}\sqrt{2!} + {}^{3^2}\sqrt{3!} + \dots + {}^{n^2}\sqrt{n!}}{n}$$

$$154. \quad \lim_{n \rightarrow \infty} \left[\cos\left(\frac{\pi n+1}{2n+3}\right) \times \tan\left(\frac{\pi n-1}{2n-3}\right) \right]$$

$$155. \quad \lim_{x \rightarrow \infty} \left[\sin\left(x + \frac{1}{x}\right) - \sin\left(x - \frac{1}{x}\right) \right]$$

$$156. \quad \lim_{x \rightarrow \infty} x^2 \cdot \text{Arc tan} \left(\cos \frac{5}{x} - \cos \frac{2}{x} \right)$$

$$157. \quad \lim_{n \rightarrow \infty} \left[n+1 - \sum_{i=2}^n \sum_{k=2}^i \left(\frac{k-1}{k!} \right) \right]$$

$$158. \quad \lim_{n \rightarrow \infty} \sqrt[n]{\frac{3^{3n} \times (n!)^3}{(3n)!}}$$

$$159. \quad \lim_{x \rightarrow 0} \frac{\ln(1-x) + \tan \frac{\pi x}{2}}{\cot \pi x}$$

$$160. \quad \lim_{x \rightarrow 1} \frac{\sin(\pi x^\alpha)}{\sin(\pi x^\beta)}$$

$$161. \quad \lim_{x \rightarrow 1} \frac{\sin^2(\pi 2^x)}{\ln[\cos(\pi 2^x)]}$$

$$162. \quad \lim_{x \rightarrow 0} \frac{3 \tan^4 x - 12 \tan x}{\sin 4x - 12 \sin x}$$

$$163. \quad \lim_{x \rightarrow 0} \frac{e^{x^3} - 1 - x^3}{\sin^6 x}$$

$$164. \quad \lim_{x \rightarrow 0} \left(\frac{a^x - x \ln a}{b^x - x \ln b} \right)^{\frac{1}{x^2}}$$

$$165. \quad \lim_{x \rightarrow 0} \frac{e^{\tan x} - e^x}{\tan x - x}$$

$$166. \quad \lim_{x \rightarrow 0} \frac{(a+x)^x - a^x}{x^2}$$

$$167. \quad \lim_{n \rightarrow \infty} \frac{1}{n} \sum_{k=1}^n \left(\frac{\sqrt[k]{k!}}{k} \right)$$

$$168. \quad \lim_{n \rightarrow \infty} n^2 \left[\left(1 + \frac{1}{n} \right)^{n+\frac{1}{2}} - e \right]$$

$$169. \quad \lim_{x \rightarrow 0} \frac{2^x + 3^x + 4^x + \dots + 2019^x - 2018}{2019^x - 1}$$

$$170. \quad \lim_{n \rightarrow \infty} \frac{2^{2n+1} \times \sqrt{n} \times (n!)^2}{(2n+1)!}$$

$$171. \quad \lim_{n \rightarrow +\infty} \sum_{k=1}^n \left(\sqrt[3]{1 + \frac{k}{n^2}} - 1 \right)$$

$$172. \quad \lim_{n \rightarrow \infty} \left[\frac{1}{n} \sum_{k=1}^n \ln^2 k - \left(\frac{1}{n} \sum_{k=1}^n \ln k \right)^2 \right]$$

$$173. \quad \lim_{x \rightarrow \infty} x \sqrt{\frac{\log x}{2^x} + \frac{\log x}{3^x}}$$

$$174. \quad \lim_{x \rightarrow \infty} x \sqrt{\frac{\log x}{3^x} + \frac{\log x}{4^x} + \frac{\log x}{5^x}}$$

$$175. \quad \lim_{x \rightarrow 0} \frac{x - \sin[\sin(\sin x)]}{x^3}$$

$$176. \quad \lim_{n \rightarrow +\infty} \left[n \left(e^{\sin \frac{\pi}{n}} - 1 \right) + \sqrt[n]{\ln n} \right]$$

$$177. \quad \lim_{x \rightarrow +\infty} \left[x^2 \cos\left(\frac{2}{x}\right) - x(x-1)e^{\frac{1}{x}} \right]$$

$$178. \quad \lim_{n \rightarrow \infty} \prod_{k=1}^n 6^k \sqrt{2}$$

$$179. \quad \lim_{n \rightarrow \infty} \frac{\frac{2\pi}{\sqrt{3}} \times (3n)! \times n}{(n!)^3 \times 27^n}$$

$$180. \quad \lim_{n \rightarrow \infty} n^2 \int_0^1 \frac{x^n \ln(1+x)}{1+x^4+x^8+\dots+x^{4n}} dx$$

$$181. \quad \lim_{n \rightarrow \infty} \frac{(2n)! \times \sqrt{n}}{(n!)^2 \times 4^n}$$

$$182. \quad \lim_{x \rightarrow \infty} x \left[\cos\left(\pi \cdot \sqrt{\frac{1}{4} + \frac{1}{x}}\right) - \cos\left(\pi \cdot \sqrt{\frac{1}{4} - \frac{1}{x}}\right) \right]$$

$$183. \quad \lim_{x \rightarrow \infty} x \int_{\ln 3 - \frac{1}{x}}^{\ln 3 + \frac{1}{x}} e^{t^2} dt$$

$$184. \quad \lim_{n \rightarrow \infty} \sin\left(\pi \sqrt{4n^2 - 2n + 1}\right)$$

$$185. \quad \lim_{x \rightarrow 0} \frac{\sqrt{1+x} - \sqrt{x + \cos x} \cdot \sqrt{\cos 2x}}{x^2}$$

186. $\lim_{x \rightarrow \infty} \frac{\ln\left(\frac{x+1}{x+2}\right)}{\sin\left(\frac{x+1}{x^2+2}\right)}$
187. $\lim_{x \rightarrow \infty} \left(\frac{1}{2^x} + \frac{1}{3^x}\right)^{\frac{1}{x}}$
188. $\lim_{k \rightarrow +\infty} \frac{1}{k} \sum_{n=1}^k \left[\sqrt{3n + \sqrt{n^2 - 1}} - 2 \left(\sqrt{n^2 - n} + \sqrt{n^2 + n} \right) \right]$
189. $\lim_{n \rightarrow \infty} \left[\left(\int_0^1 e^{\frac{x^2}{n}} dx \right) \left(\int_0^1 e^{\frac{x^3}{n}} dx \right) \left(\int_0^1 e^{\frac{x^4}{n}} dx \right) \right]^n$
190. $\lim_{n \rightarrow \infty} \left\{ \sqrt[n]{(n!)^2} \cdot \sin^2\left(\frac{n}{n+1}\right) \times \left[\frac{1}{(n+1)^2} \cdot \sqrt[n+1]{(n+1)! \times \sin\left(\frac{n+1}{n+2}\right)} - \frac{1}{n^2} \cdot \sqrt[n]{n! \times \sin\left(\frac{n}{n+1}\right)} \right] \right\}$
191. $\lim_{n \rightarrow \infty} \sum_{i=1}^n \left\{ \sum_{j=1}^n \left[\sum_{k=1}^n \left(\frac{1}{n} \cos \frac{i}{n} \times \frac{1}{n} \cos \frac{j}{n} \times \frac{1}{n} \cos \frac{k}{n} \right) \right] \right\}$
192. $\lim_{n \rightarrow \infty} \sum_{k=1}^n \left\{ \operatorname{Arc} \tan \left[\frac{1}{2(k+1)^2} \right] \times \operatorname{Arc} \tan \left[\frac{2k^2 + 4k + 1}{2(k+1)} \right] \right\}$
193. $\lim_{x \rightarrow 0} \frac{1 - \cos^n x \cdot \cos nx}{x^2}$
194. $\lim_{x \rightarrow 0^+} x \left[1 - \sum_{n=0}^{\infty} \frac{(-x)^n}{(2n+1)!} \right]$
195. $\lim_{x \rightarrow 0} \left[\frac{(x+1)^{n+1} - (x+1)}{x^3} - \frac{n}{x^2} - \frac{n(n+1)}{2x} \right]$
196. $\lim_{n \rightarrow +\infty} n \left\{ \prod_{p=1}^n \left[\sum_{k=1}^p \frac{1}{k(k+1)} \right] \right\}$
197. $\lim_{n \rightarrow +\infty} \frac{1 + 11 + 111 + \cdots + \overbrace{111 \cdots 1}^{n \text{ times}}}{10^n}$

$$198. \quad \lim_{n \rightarrow +\infty} \left[\frac{1}{2 + \sqrt{2}} + \frac{1}{3\sqrt{2} + 2\sqrt{3}} + \cdots + \frac{1}{(n+1)\sqrt{n} + n\sqrt{n+1}} \right]$$

$$199. \quad \lim_{x \rightarrow +\infty} \frac{3x - 5 \cos x}{4x - 7 \sin x}$$

$$200. \quad \lim_{x \rightarrow +\infty} \left(\cos \frac{1}{x} + \sin \frac{1}{x} \right)^x$$

$$201. \quad \lim_{x \rightarrow 0} \frac{(e^x + e^{-x})^n - 2^n}{x}$$

$$202. \quad \lim_{x \rightarrow \frac{\pi}{4}} \frac{\sin^n x - \cos^n x}{4x - \pi}$$

$$203. \quad \lim_{x \rightarrow \pm\infty} \frac{(\sqrt{x^2 + 1} - x)^{2017} + (\sqrt{x^2 + 1} + x)^{2017}}{x^{2017}}$$

$$204. \quad \lim_{x \rightarrow i} \frac{x^3 + 2i x^2 + (2+i)x + 1 + i}{x^4 - i x^3 + 2i x^2 + 3x - i}, \quad i \in \mathbb{C}$$

$$205. \quad \lim_{x \rightarrow 1} \frac{x^{n+1} - (n+2)x^n + nx + 1}{x - 1}$$

$$206. \quad \lim_{x \rightarrow \pi} \frac{e^2 - e^{1 - \cos x}}{(x - \pi)^2}$$

$$207. \quad \lim_{x \rightarrow 0} \frac{\sqrt[n]{ax+1} \cdot \sqrt[m]{bx+1} - 1}{x}$$

$$208. \quad \lim_{n \rightarrow +\infty} \frac{1^3 + 4^3 + 7^3 + \cdots + (3n-2)^3}{[1 + 4 + 7 + \cdots + (3n-2)]^2}$$

$$209. \quad \lim_{x \rightarrow 0} \frac{(x+2) \cdot \sin\left(x + \frac{\pi}{6}\right) - 1}{x^2 + x}$$

$$210. \quad \lim_{x \rightarrow 0} \left(\frac{2^{x+1} + 3^{x+1} + 4^{x+1}}{9} \right)^{\frac{1}{x}}$$

$$211. \quad \lim_{x \rightarrow 1} \frac{\sqrt{x+1} + \sqrt{x^2-1} - \sqrt{x^3+1}}{\sqrt{x-1} + \sqrt{x^2+1} - \sqrt{x^4+1}}$$

$$212. \quad \lim_{x \rightarrow +\infty} \left[\log_2 x + \log_2 \left(\sin \frac{2}{x} \right) \right]$$

$$213. \quad \lim_{x \rightarrow \frac{\pi}{4}} \left(4x \cdot \tan 2x - \frac{\pi}{\cos 2x} \right)$$

$$214. \quad \lim_{x \rightarrow 2} \frac{\ln(4-x) - \ln 2}{\ln(x^2 + 3x - 9)}$$

$$215. \quad \lim_{x \rightarrow 0} \frac{e^x - x - 1}{x(e^x - 1)}$$

$$216. \quad \lim_{x \rightarrow 0} \frac{x - \sin x}{x - e^x + 1}$$

$$217. \quad \lim_{x \rightarrow \frac{\pi}{4}} \frac{\cot^n x + (n-1)\cot x - n}{\tan^3 x - 3 \tan x + 2}$$

$$218. \quad \lim_{x \rightarrow e} \frac{2 \ln^{2018} x - 5 \ln^{100} x + 3}{\ln^{2018} x - 1}$$

$$219. \quad \lim_{x \rightarrow +\infty} (2x+1) \left[\ln(e^x + 1) - \ln(e^x + 3) \right]$$

$$220. \quad \lim_{x \rightarrow \pm\infty} \frac{\left(\sqrt{x^2 + x + 1} - x \right)^{2018}}{\left(\sqrt{x^4 + x^2 - 2} - x^2 \right)^{1004}}$$

$$221. \quad \lim_{x \rightarrow 1} \frac{2^x + 3^{2x} + 5^{3x} - 136}{2^{3x} + 3^{2x} + 5^x - 22}$$

$$222. \quad \lim_{x \rightarrow 0} \frac{2 - f''(x)}{x^2}, \quad f(x) = x \sin x$$

$$223. \quad \lim_{x \rightarrow 1} \frac{x^3 + 2mx^2 + (m+1)x - 3m - 2}{x^{40} - mx^{30} + m - 1}$$

$$224. \quad \lim_{x \rightarrow \frac{\pi}{4}} \frac{\tan x - 1}{2 \cos x - \sqrt{2}}$$

$$225. \quad \lim_{x \rightarrow +\infty} \left(\cos \sqrt{x+1} - \cos \sqrt{x} \right)$$

$$226. \quad \lim_{x \rightarrow 1} \frac{x^2 + \sqrt{x^3 + 1} - \sqrt{x^4 + 1} - 1}{x + \sqrt{x+1} - \sqrt{x^2 + 1} - 1}$$

$$227. \quad \lim_{x \rightarrow -\frac{\pi}{4}} \frac{\sqrt[3]{\sin x} + \sqrt[3]{\cos x}}{\cos 2x}$$

$$228. \quad \lim_{x \rightarrow 0} \frac{\cos^n x - 5 \cos x + 4}{\cos^n x - 4 \cos x + 3}$$

$$229. \quad \lim_{x \rightarrow 1} \left(\frac{m}{1-x^m} - \frac{n}{1-x^n} \right)$$

$$230. \quad \lim_{x \rightarrow 0} \frac{\sqrt{x + \cos x} - \sqrt{(1+x) \cos x}}{\sin 3x - 3 \sin x}$$

$$231. \quad \lim_{x \rightarrow e} \frac{\ln^{2020} x - 7 \ln^{2019} x + 6}{\ln^{2018} x + 5 \ln^{2017} x - 6}$$

$$232. \quad \lim_{x \rightarrow \frac{\pi}{12}} \frac{\tan 3x - 1}{2 \sin 2x - 1}$$

$$233. \quad \lim_{x \rightarrow 0} \frac{1 + \sin x - \cos x}{1 - \sin x - \cos x}$$

$$234. \quad \lim_{x \rightarrow 0} \frac{n - (\cos x + \cos 2x + \dots + \cos nx)}{x^2}$$

$$235. \quad \lim_{x \rightarrow 0} \frac{1 - (1 + a \sin x)^n}{x}$$

$$236. \quad \lim_{x \rightarrow 0} \frac{(1 + a \sin x)^m - (1 + b \sin x)^n}{x}$$

$$237. \quad \lim_{x \rightarrow 0} \frac{x + \cos nx - \sqrt[n]{nx+1}}{x^2}$$

$$238. \quad \lim_{x \rightarrow 0} \frac{1 - (1 + a \sin x)^m \times (1 + b \sin x)^n}{x}$$

$$239. \quad \lim_{x \rightarrow 0} \frac{\cos x + 2 \cos 2x + 3 \cos 3x - 6}{x^2}$$

$$240. \quad \lim_{x \rightarrow 0} \frac{\cos x + 2 \cos 2x + 3 \cos 3x + \dots + n \cos nx - \frac{n(n+1)}{2}}{x^2}$$

$$241. \quad \lim_{x \rightarrow 0} \frac{\sqrt{1 - \cos x} + \sqrt{1 + \cos^3 x} - \sqrt{1 + \cos^4 x}}{\sqrt{1 + \cos x} + \sqrt{1 - \cos^2 x} - \sqrt{1 + \cos^2 x}}$$

$$242. \quad \lim_{x \rightarrow 0} \frac{1 - \cos^m x}{1 - \cos^n x}$$

$$243. \quad \lim_{n \rightarrow +\infty} \left(\frac{1}{1^2} + \frac{1}{2^2} + \dots + \frac{1}{n^2} \right)$$

$$244. \quad \lim_{n \rightarrow +\infty} \left(\frac{\sin x}{1 + 2 \cos 2x} + \frac{1}{3} \times \frac{\sin \frac{x}{3}}{1 + 2 \cos \frac{2x}{3}} + \dots + \frac{1}{3^n} \times \frac{\sin \frac{x}{3^n}}{1 + 2 \cos \frac{2x}{3^n}} \right)$$

$$245. \quad \lim_{n \rightarrow +\infty} \left(\frac{\tan \frac{x}{2}}{\cos x} + \frac{1}{2} \times \frac{\tan \frac{x}{2^2}}{\cos \frac{x}{2}} + \dots + \frac{1}{2^n} \times \frac{\tan \frac{x}{2^{n+1}}}{\cos \frac{x}{2^n}} \right)$$

$$246. \quad \lim_{x \rightarrow 0} \frac{x \cos x - \sin x}{x^3}$$

$$247. \quad \lim_{n \rightarrow +\infty} \frac{1}{\sqrt{n^3}} \sum_{k=1}^n \left[k \cdot \ln \left(1 + \frac{k}{\sqrt{n^3}} \right) \right]$$

$$248. \quad \lim_{n \rightarrow +\infty} \frac{1}{n^2} \sum_{k=1}^n \left(k \cdot \cos \frac{k\pi}{n^2} \right)$$

$$249. \quad \lim_{n \rightarrow +\infty} \left[\sin^2 \left(\frac{\sqrt{1}}{n} \right) + \sin^2 \left(\frac{\sqrt{2}}{n} \right) + \dots + \sin^2 \left(\frac{\sqrt{n}}{n} \right) \right]$$

$$250. \quad \lim_{x \rightarrow 0} \frac{1+x-\sqrt[n]{nx+1}}{x^2}$$

$$251. \quad \lim_{x \rightarrow 0} \left(\frac{e^x}{x+1} \right)^{\frac{1}{x^2}}$$

$$252. \quad \lim_{x \rightarrow 0} \left(\frac{\cos x}{1+\frac{x^2}{2}} \right)^{\frac{1}{x^4}}$$

$$253. \quad \lim_{n \rightarrow +\infty} \frac{\sum_{k=1}^n \left[\frac{k! \times k}{\sqrt{k!} + \sqrt{(k+1)!}} \right] - \sqrt{n! \times n}}{\sqrt{(n-1)!}}$$

$$254. \quad \lim_{n \rightarrow +\infty} \left[\frac{1}{\sqrt{2}} \times \frac{1}{\sqrt{1!} + \sqrt{2!}} + \frac{2}{\sqrt{3}} \times \frac{1}{\sqrt{2!} + \sqrt{3!}} + \dots + \frac{n}{\sqrt{n+1}} \times \frac{1}{\sqrt{n!} + \sqrt{(n+1)!}} \right]$$

$$255. \quad \lim_{x \rightarrow 0} \frac{x^{n+1} \cdot \cot^{n+1} x - (n+1)x \cot x + n}{x^2 (1 - x \cot x)}$$

$$256. \quad \lim_{x \rightarrow 0} \left(\frac{\frac{1}{x^2} - \frac{\cot^2 x + \cot^2 2x + \dots + \cot^2 nx}{1 + \frac{1}{2^2} + \frac{1}{3^2} + \dots + \frac{1}{n^2}}}{\frac{1}{x^2}} \right)$$

$$257. \quad \lim_{x \rightarrow 0} \frac{\sqrt{2} (x^2 - x \sin x + \sin^2 x) - \sqrt{x^4 + \sin^4 x}}{x^{10}}$$

$$258. \quad \lim_{x \rightarrow 0} \frac{\sqrt{2} (x^2 - x \tan x + \tan^2 x) - \sqrt{x^4 + \tan^4 x}}{x^{10}}$$

$$259. \quad \lim_{x \rightarrow 0} \left[\frac{x^4 + \tan^4 x}{2(x^2 - x \tan x + \tan^4 x)^2} \right]^{\frac{1}{x^8}}$$

$$260. \quad \lim_{x \rightarrow 0} \left(\frac{1}{x^2} - \cot^2 x \right)$$

$$261. \quad \lim_{x \rightarrow 0} \frac{\sin(3x + 2020\pi)}{\sin(4x + 2019\pi)}$$

$$262. \quad \lim_{x \rightarrow +\infty} \frac{5x + (-1)^x}{x + (-1)^x}$$

$$263. \quad \lim_{n \rightarrow +\infty} \sum_{k=1}^n \frac{k^4 + 10k^3 + 35k^2 + 50k + 23}{(k+4)!}$$

$$264. \quad \lim_{x \rightarrow \frac{\pi}{8}} \frac{\tan x + \cot x - 2\sqrt{2}}{x - \frac{\pi}{8}}$$

$$265. \quad \lim_{x \rightarrow \pi} \frac{1 - \sin \frac{x}{2}}{\cos \frac{x}{2} \left(\cos \frac{x}{4} - \sin \frac{x}{4} \right)}$$

$$266. \quad \lim_{x \rightarrow 1} \frac{n x^n - (n+1)x + 1}{m x^m - (m+1)x + 1}$$

$$267. \quad \lim_{x \rightarrow 0} \frac{1 - \cos \left[x(1 - e^x) \right]}{x^2}$$

$$268. \quad \lim_{x \rightarrow 1} \frac{\sin^2(\ln x)}{1 + \cos \pi x}$$

$$269. \quad \lim_{x \rightarrow 0^+} \left[\cos(2x + \log x) - \cos(3x - \log x) \right]$$

$$270. \quad \lim_{x \rightarrow 1} \frac{1 - \cos h(\log x)}{\sin^2(\pi x)}$$

$$271. \quad \lim_{x \rightarrow 0} \frac{\cos 2x + \cos 4x - 2 \cos 6x}{x^2}$$

$$272. \quad \lim_{x \rightarrow 0} \frac{\sin 2x + \sin 4x - \sin 6x}{x^3}$$

$$273. \quad \lim_{n \rightarrow \infty} \sum_{k=0}^{\infty} \left(\frac{C_{n+k}^n}{n^k} \right)$$

$$274. \quad \lim_{x \rightarrow 0} \frac{x(2 + \cos x) - 3 \sin x}{x^5}$$

$$275. \quad \lim_{x \rightarrow 0} \frac{\cos x + 2 \cos 2x - 3 \cos 3x}{x^2}$$

$$276. \quad \lim_{x \rightarrow +\infty} \frac{\int_x^{x+1} \frac{1}{k} dk}{x}$$

$$277. \quad \lim_{x \rightarrow 0} \frac{(4x + 1)^{kx} - 1}{\cos x - \cos 6x}$$

$$278. \quad \lim_{x \rightarrow 0^+} \frac{\sqrt{x} - \sqrt{\ln(x+1)} + \sin[\ln(x+1)]}{\sin \frac{x}{2}}$$

$$279. \quad \lim_{x \rightarrow 0^+} \frac{\sqrt{x} - \sin[\log(x+1)]}{\sqrt{x}}$$

$$280. \quad \lim_{x \rightarrow \frac{\pi}{2}} \frac{\sin[(4k+2)x]}{\sin(\cos x)}, \quad k \in \mathbb{Z}$$

$$281. \quad \lim_{n \rightarrow \infty} \frac{1}{n} \sum_{k=1}^n \tan\left(\frac{k\pi}{4n}\right)$$

$$282. \quad \lim_{x \rightarrow 0} \frac{\ln(1 + \sin x) + \ln(1 - \sin x)}{x^2}$$

$$283. \quad \lim_{x \rightarrow 0} \frac{2^{1+x} + 2^{1-x} - 4}{x^2}$$

$$284. \quad \lim_{x \rightarrow 0} [\ln(1 - \cos x) - \ln(x^2)]$$

$$285. \quad \lim_{x \rightarrow 0} \frac{1}{x^3} \int_{2x}^{x^2} t \cdot \text{Arc tan } t \, dt$$

$$286. \quad \lim_{x \rightarrow 1} \frac{1 - x + \ln x}{1 + \cos(\pi x)}$$

$$287. \quad \lim_{x \rightarrow 0} \left(\frac{2}{x} - \frac{2}{e^x - 1} \right)$$

$$288. \quad \lim_{x \rightarrow 0} \left(\frac{4}{x} - \frac{4}{\sin x} \right)$$

$$289. \quad \lim_{n \rightarrow \infty} \sum_{k=1}^n \left(\frac{k^n}{n^n} \right)$$

$$290. \quad \lim_{x \rightarrow 0} \left[\frac{1}{x} - \frac{1}{\log(x+1)} \right]$$

$$291. \quad \lim_{x \rightarrow 0} \frac{(\cos x)^{\sin x} - 1}{x^2 \sin x}$$

$$292. \quad \lim_{x \rightarrow \frac{\pi}{4}} \frac{2^{\cos x - \sin x} - 1}{4x - \pi}$$

$$293. \quad \lim_{x \rightarrow 0} \left\{ \int_0^1 [by + a(1-y)]^x dy \right\}^{\frac{1}{x}}, \quad b > a$$

$$294. \quad \lim_{x \rightarrow \infty} \frac{(x - \sqrt{x^2 - 1})^n - (x + \sqrt{x^2 - 1})^n}{x^n}$$

$$295. \quad \lim_{x \rightarrow 0} \left(\frac{a^{x+1} + b^{x+1} + c^{x+1}}{a + b + c} \right)^{\frac{1}{x}}$$

$$296. \quad \lim_{x \rightarrow 0} \left(\frac{a_1^{x+1} + a_2^{x+1} + \dots + a_n^{x+1}}{a_1 + a_2 + \dots + a_n} \right)^{\frac{1}{x}}$$

$$297. \quad \lim_{x \rightarrow \frac{\pi}{4}} \frac{1 + n \cos 2x - 2^n \cdot \cos^{2n} x}{1 + \cos 4x}$$

$$298. \quad \lim_{x \rightarrow \infty} \frac{\int_2^x \left(1 - \frac{2}{t} \right)^t dt}{x - 2}$$

$$299. \quad \lim_{x \rightarrow 0} \frac{|x+1| - |x-1|}{x}$$

$$300. \quad \lim_{n \rightarrow \infty} \left[4^n \int_0^1 x^n \cdot (1-x)^n dx \right]^{\frac{1}{\sqrt{n}}}$$

$$301. \quad \lim_{x \rightarrow \frac{\pi}{4}} \frac{\tan x - \sqrt{2} \cos x}{\cot x - \sqrt{2} \sin x}$$

$$302. \quad \lim_{x \rightarrow \infty} \frac{\int_0^{x^2} \frac{t^4}{1+t^3} dt}{x^4}$$

$$303. \quad \lim_{x \rightarrow \infty} \frac{\int_0^x \sqrt{3+16t^2} dt}{x^2 + 1}$$

$$304. \quad \lim_{n \rightarrow \infty} \left[{}^{n+1}\sqrt{(n+1)!} - {}^n\sqrt{n!} \right]$$

$$305. \quad \lim_{n \rightarrow \infty} \frac{1 + \frac{1}{2} + \frac{1}{3} + \dots + \frac{1}{n^3}}{\ln n}$$

$$306. \quad \lim_{x \rightarrow 1} \frac{\cos(\log x) - \cos(\ln x)}{(x-1)^2}$$

$$307. \quad \lim_{x \rightarrow 1} \frac{3.\sqrt[3]{x} + 5.\sqrt[5]{x} + 7.\sqrt[7]{x} + 9.\sqrt[9]{x} - 24}{\sqrt[11]{x} - 1}$$

$$308. \quad \lim_{x \rightarrow 1} \frac{\sin(\ln x)}{\operatorname{Arc} \tan x - \frac{\pi}{4}}$$

$$309. \quad \lim_{x \rightarrow 0} \frac{[1 - \cos(1 - \cos x)]^2}{x^8}$$

$$310. \quad \lim_{x \rightarrow \frac{\pi}{3}} \frac{\tan^3 x - 3 \tan x}{\cos\left(x + \frac{\pi}{6}\right)}$$

$$311. \quad \lim_{x \rightarrow 1} \frac{x^6 - x^5 + x^2 - 1}{\sqrt[3]{x} - \sqrt[5]{x} - \sqrt{x} + 1}$$

$$312. \quad \lim_{x \rightarrow 0} \frac{1 - \ln(e+x) \cdot \ln(e+2x)}{x}$$

$$313. \quad \lim_{x \rightarrow 0} \frac{1 - \ln(e+x) \times \ln(e+2x) \times \dots \times \ln(e+nx)}{x}$$

$$314. \quad \lim_{z \rightarrow -i} \frac{iz^3 + 1}{z^2 + 1}, \quad i \in \mathbb{C}, i^2 = -1$$

$$315. \quad \lim_{z \rightarrow 3i} \frac{z^2 + 9}{z - 3i}, \quad i \in \mathbb{C}, i^2 = -1$$

$$316. \quad \lim_{z \rightarrow 3i} \frac{z^3 + 27i}{z^2 + 9}, \quad i \in \mathbb{C}, i^2 = -1$$

$$317. \quad \lim_{x \rightarrow 0} \frac{\ln(e+x) - \ln(e-x)}{x}$$

$$318. \quad \lim_{x \rightarrow 1} \frac{\sin\left(\cos^4 \frac{\pi x}{2}\right)}{(x-1)^2 \cdot (1 + \cos \pi x)}$$

$$319. \quad \lim_{x \rightarrow 1} \frac{\cosh\left(1 - \sin \frac{\pi x}{2}\right) - 1}{(x-1)^4}$$

$$320. \quad \lim_{x \rightarrow 0} \frac{x - e^x + \cos x}{\sin^2 x}$$

$$321. \quad \lim_{x \rightarrow 0} \frac{e^x \cdot \sin x - \tan x}{\cos 12x - \cos 4x}$$

$$322. \quad \lim_{x \rightarrow 0} \frac{\cosh(mx) - \cosh(nx)}{\cos(px) - \cos(qx)}$$

$$323. \quad \lim_{x \rightarrow 1} \frac{3 \sin \pi x - \sin(3\pi x)}{(x-1)^3}$$

$$324. \quad \lim_{n \rightarrow +\infty} \frac{2^{4n} \cdot (n!)^4}{n \cdot [(2n)!]^2}$$

$$325. \quad \lim_{n \rightarrow \infty} \frac{1}{n} \cdot \sqrt[n]{\frac{(2n)!}{n!}}$$

$$326. \quad \lim_{x \rightarrow 0} \frac{\ln(\cos ax)}{\ln(\cos bx)}$$

$$327. \quad \lim_{x \rightarrow +\infty} \left(\frac{a^{\frac{1}{x}} + b^{\frac{1}{x}} + c^{\frac{1}{x}}}{3} \right)^x$$

$$328. \quad \lim_{x \rightarrow +\infty} \left[\frac{\ln(x+1)}{\ln x} \right]^{x \ln x}$$

$$329. \quad \lim_{x \rightarrow 0} \frac{e^{\operatorname{Arc} \sin x} - e^{\sin x}}{e^{\operatorname{Arc} \tan x} - e^{\tan x}}$$

$$330. \quad \lim_{x \rightarrow \infty} x^2 \cdot \left(e^{\frac{1}{x}} - e^{\frac{1}{x+1}} \right)$$

$$331. \quad \lim_{x \rightarrow \infty} x^3 \cdot \left(\operatorname{Arc} \tan x - \operatorname{Arc} \cos \frac{1}{x} \right)$$

$$332. \quad \lim_{x \rightarrow 1} \frac{x^x - x}{1 - x + \ln x}$$

$$333. \quad \lim_{x \rightarrow 0} \frac{(1 - \cos x) \cdot \operatorname{Arc} \sin x}{x \cdot \tan^2 x}$$

$$334. \quad \lim_{x \rightarrow 0} \left[\ln(1 + \sin x) \right]^{\sin x}$$

$$335. \quad \lim_{x \rightarrow 0} \frac{\ln(1 + x^2)}{x \cdot \operatorname{Arc} \tan x}$$

$$336. \quad \lim_{x \rightarrow 0} (\cos x + \sin x)^{\frac{1}{\tan x}}$$

$$337. \quad \lim_{x \rightarrow 0} \frac{\ln(1+x) - \sin x + 1 - \cos x}{\tan x - x}$$

$$338. \quad \lim_{x \rightarrow 0} (\cos x)^{\ln x}$$

$$339. \quad \lim_{x \rightarrow \frac{\pi}{6}} \frac{\operatorname{Arc} \tan(2 \sin x) - \frac{\pi}{4}}{\cos 3x}$$

$$340. \quad \lim_{x \rightarrow 0} \frac{\sin^2 x - x \ln(1+x)}{e^x + \cos x - \sin x - 2}$$

$$341. \quad \lim_{x \rightarrow 0} \frac{x^2 - 1}{x} \cdot e^{\frac{1}{x}}$$

$$342. \quad \lim_{x \rightarrow 0} \frac{e^x - \cos x - x}{x - \ln(1+x)}$$

$$343. \quad \lim_{m \rightarrow 0} \frac{1}{m^2} \left(\frac{\sin mx}{\sin ml} - \frac{x}{l} \right)$$

$$344. \quad \lim_{x \rightarrow +\infty} \left[e \cdot \sqrt{x^2 - x + 1} - x \cdot \left(1 + \frac{1}{x} \right)^x \right]$$

$$345. \quad \lim_{x \rightarrow +\infty} [x - \ln(chx)]$$

$$346. \quad \lim_{x \rightarrow 0} \frac{1}{x} \left[\left(1 + shx \right)^{\frac{1}{\tan x}} - e \right]$$

$$347. \quad \lim_{x \rightarrow +\infty} \left[\ln\left(\frac{1}{x}\right) - e^x \right]$$

$$348. \quad \lim_{x \rightarrow 2} \frac{x - 1 - e^{x-2}}{1 - \cos(2\pi x)}$$

$$349. \quad \lim_{x \rightarrow 0} \frac{x - \text{Arc tan } x}{x^4}$$

$$350. \quad \lim_{x \rightarrow 0} \frac{x - \text{Arc tan } x}{x - \text{Arc sin } x}$$

$$351. \quad \lim_{x \rightarrow 0^+} \left(\frac{1}{\tan x} - \frac{1}{x} \right)$$

$$352. \quad \lim_{x \rightarrow 0} \frac{x \cos x - \sin x}{x^2 \sin x}$$

$$353. \quad \lim_{x \rightarrow 0^+} \frac{(1+x)^{\frac{1}{x}} - e}{x}$$

$$354. \quad \lim_{x \rightarrow 0} \frac{p \sin(px) - p^2 x}{x^3}$$

$$355. \quad \lim_{x \rightarrow 0^+} \frac{\ln(\sin px)}{\ln(\sin qx)}$$

$$356. \quad \lim_{x \rightarrow 0^+} \left(\frac{1}{x} - \frac{1}{\sin x} \right)$$

$$357. \quad \lim_{x \rightarrow a} \frac{x^n - a^n}{x^m - a^m}, \quad (m, n) \in (\mathbb{N}^*)^2, \quad a > 0$$

$$358. \quad \lim_{x \rightarrow b} \frac{x^{\frac{1}{n}} - b^{\frac{1}{n}}}{x^{\frac{1}{m}} - b^{\frac{1}{m}}}, \quad (m, n) \in (\mathbb{N}^*)^2, \quad b > 0$$

$$359. \quad \lim_{x \rightarrow 0} \frac{\sqrt{b+x} - \sqrt{b-x}}{\sqrt{c+x} - \sqrt{c-x}}, \quad b, c > 0$$

$$360. \quad \lim_{x \rightarrow 0} \frac{\sqrt{ax+b} - \sqrt{b}}{\sqrt{cx+d} - \sqrt{d}}, \quad a, b, c, d > 0$$

$$361. \quad \lim_{x \rightarrow +\infty} \left(\sqrt{ax + \sqrt{bx}} - \sqrt{ax + \sqrt{cx}} \right), \quad a, b, c > 0$$

$$362. \quad \lim_{x \rightarrow +\infty} \left(x\sqrt{ax^2 + b} - x^2 \sqrt{a} \right), \quad a, b > 0$$

$$363. \quad \lim_{x \rightarrow 1} \frac{x + x^2 + x^3 + \dots + x^n - n}{x + x^2 + x^3 + \dots + x^m - m}$$

$$364. \quad \lim_{x \rightarrow 1} \frac{x^n - nx + n - 1}{x^m - mx + m - 1}$$

$$365. \quad \lim_{x \rightarrow 1} \frac{(2x-1)^{444} + (2-x)^{888} - 2}{(2x-1)^{222} + (2-x)^{666} - 2}$$

$$366. \quad \lim_{x \rightarrow 0} \frac{\sqrt{x+1} + \sqrt{2x+1} + \dots + \sqrt{nx+1} - n}{x}$$

$$367. \quad \lim_{x \rightarrow 0} \frac{(1+x)(2+x) \dots (n+x) - n!}{(1+x)(2+x) \dots (m+x) - m!}$$

368. $\lim_{x \rightarrow 0} \frac{\sqrt{2x+1} + \sqrt[3]{3x+1} + \dots + \sqrt[n]{nx+1} - n}{\sqrt{2x+1} + \sqrt[3]{3x+1} + \dots + \sqrt[n]{mx+1} - m}$
369. $\lim_{x \rightarrow 0} \frac{\sqrt{2x+4} \cdot \sqrt[3]{3x+27} \dots \sqrt[n]{nx+n^n} - n!}{x}$
370. $\lim_{x \rightarrow \pm\infty} \frac{(x+1)^2 + (2x+1)^2 + \dots + (nx+1)^2}{(x-1)^2 + (2x-1)^2 + \dots + (mx-1)^2}$
371. $\lim_{x \rightarrow 0} \frac{1 - \cos x \cdot \cos 2x \dots \cos nx}{1 - \cos x \cdot \cos 2x \dots \cos mx}$
372. $\lim_{x \rightarrow 0} \frac{1 - \cos x \cdot \sqrt{\cos 2x} \dots \sqrt[m]{\cos mx}}{1 - \cos x \cdot \sqrt{\cos 2x} \dots \sqrt[n]{\cos nx}}$
373. $\lim_{x \rightarrow 0} \frac{(\cos x \cdot \cos 2x \dots \cos nx) - (\cos x \cdot \cos 2x \dots \cos mx)}{x^2}$
374. $\lim_{x \rightarrow 0} \frac{e^x - x - 1 - \frac{x^2}{2}}{x^3}$
375. $\lim_{x \rightarrow 0} \frac{\cos x - 1 - \frac{x^2}{2}}{x^3}$
376. $\lim_{x \rightarrow 0} \frac{\sin kx - k \sin x}{m \sin x - \sin mx}$
377. $\lim_{x \rightarrow 0} \frac{e^x + e^{2x} + \dots + e^{nx} - n}{e^x + e^{2x} + \dots + e^{mx} - m}$
378. $\lim_{x \rightarrow 0} \frac{x \sin(\sin x) - \sin^2 x}{x^6}$
379. $\lim_{x \rightarrow 3} \frac{x! - 6}{x - 3}$
380. $\lim_{x \rightarrow 0^+} \frac{\sqrt[3]{x} + \sqrt[5]{x} + \sqrt[7]{x}}{\sqrt{x} + \sqrt[4]{x} + \sqrt[6]{x}}$

$$381. \quad \lim_{x \rightarrow 0} \left(\frac{1}{\sin^2 x} - \frac{1}{x^2} \right)$$

$$382. \quad \lim_{x \rightarrow 0} \left[\frac{1}{x^2} - \left(1 + \frac{1}{x^2} \right) \cdot \frac{\sin^2 x}{x^2} \right]$$

$$383. \quad \lim_{n \rightarrow \infty} \left(\frac{2^n + 4^n}{5^n + 6^n} \right)^{\frac{1}{n}}$$

$$384. \quad \lim_{x \rightarrow -1} \frac{\sqrt{\pi} - \sqrt{\text{Arc cos } x}}{x + 1}$$

$$385. \quad \lim_{x \rightarrow \frac{1}{\sqrt{2}}} \frac{\text{Arc sin } x - \text{Arc cos } x}{1 - x\sqrt{2}}$$

$$386. \quad \lim_{x \rightarrow 0} \frac{\sqrt[m]{1+x^n} - \sqrt[m]{1-x^n}}{x^n}$$

$$387. \quad \lim_{x \rightarrow 1} \frac{(1+x^m)^n \cdot (1+x^n)^m - 2^{m+n}}{x-1}$$

$$388. \quad \lim_{x \rightarrow 1} \frac{(1+\sqrt[m]{x})(1+\sqrt[n]{x}) - 4}{x-1}$$

$$389. \quad \lim_{x \rightarrow \ln\left(\frac{3\pi}{2}\right)} \frac{\sin(e^x) + 1}{\left(e^x - \frac{3\pi}{2}\right)^2}$$

$$390. \quad \lim_{n \rightarrow \infty} \frac{n!}{n^n}$$

$$391. \quad \lim_{n \rightarrow \infty} \frac{n! + (n-1)!}{(n-1)! + (n-2)!}$$

$$392. \quad \lim_{n \rightarrow \infty} \left[n \cdot \ln \left(\frac{\tan \frac{\pi}{4} + \tan \frac{\pi}{n}}{1 - \tan \frac{\pi}{4} \cdot \tan \frac{\pi}{n}} \right) \right]$$

$$393. \quad \lim_{n \rightarrow \infty} \left[n^2 + n - \sum_{k=1}^n \left(\frac{2k^3 + 8k^2 + 6k - 1}{k^2 + 4k + 3} \right) \right]$$

$$394. \quad \lim_{x \rightarrow 0^+} \frac{\overbrace{\sqrt{2 + \sqrt{2 + \cdots + \sqrt{2 + 2 \cos x}}}}^{n \text{ roots}} - 2}{x}$$

$$395. \quad \lim_{n \rightarrow \infty} \left[\sqrt{n + \sqrt{(n-1) + \sqrt{(n-2) + \cdots + \sqrt{3 + \sqrt{2 + \sqrt{1}}}}} - \sqrt{n}} \right]$$

$$396. \quad \lim_{x \rightarrow \infty} \left(\sqrt{x^2 + 2x + 1} + \sqrt{x^2 + 4x + 1} + \cdots + \sqrt{x^2 + 2nx + 1} - \sqrt{n^2 x^2 + 1} \right)$$

$$397. \quad \lim_{x \rightarrow 1} \frac{x^m + 1 - \sqrt[n]{x^2 - x + 2^n}}{x^n + 1 - \sqrt[m]{x^2 - x + 2^m}}, \quad (m, n) \in \mathbb{N}^2, m \geq 2, n \geq 2$$

$$398. \quad \lim_{n \rightarrow \infty} \frac{1.1! + 2.2! + \cdots + n.n!}{(n+1)!}$$

$$399. \quad \lim_{n \rightarrow \infty} \left(\frac{1}{1} + \frac{1}{1+2} + \frac{1}{1+2+3} + \cdots + \frac{1}{1+2+3+\cdots+n} \right)$$

$$400. \quad \lim_{x \rightarrow \infty} \left(\sqrt{x^2 + x} + \sqrt{x^2 + 2x} + \cdots + \sqrt{x^2 + nx} - nx \right)$$

$$401. \quad \lim_{n \rightarrow \infty} \left[\frac{1^2 + 4^2 + 7^2 + \cdots + (3n-2)^2}{6n^2} - \frac{n}{2} \right]$$

$$402. \quad \lim_{n \rightarrow \infty} \left[\frac{1}{3^2} + \frac{2}{15^2} + \frac{3}{35^2} + \cdots + \frac{n}{(4n^2 - 1)^2} \right]$$

$$403. \quad \lim_{n \rightarrow \infty} \left(\frac{1}{2} + \frac{3}{2^2} + \frac{5}{2^3} + \cdots + \frac{2n-1}{2^n} \right)$$

$$404. \quad \lim_{n \rightarrow \infty} \left[\frac{3}{4} + \frac{5}{36} + \cdots + \frac{2n+1}{n^2 \cdot (n+1)^2} \right]$$

$$405. \quad \lim_{n \rightarrow \infty} \frac{1}{\sqrt{n}} \left(\frac{1}{\sqrt{1} + \sqrt{2}} + \frac{1}{\sqrt{2} + \sqrt{3}} + \cdots + \frac{1}{\sqrt{n} + \sqrt{n+1}} \right)$$

$$406. \quad \lim_{n \rightarrow \infty} \left[\frac{1}{1 \times 2 \times 3} + \frac{1}{2 \times 3 \times 4} + \cdots + \frac{1}{n(n+1)(n+2)} \right]$$

$$407. \quad \lim_{n \rightarrow \infty} \left[\frac{1}{1 \times 3} + \frac{1}{3 \times 5} + \cdots + \frac{1}{(2n-1)(2n+1)} \right]$$

$$408. \quad \lim_{n \rightarrow \infty} \left(1 + \frac{1}{10} \right) \left(1 + \frac{1}{10^2} \right) \times \cdots \times \left(1 + \frac{1}{10^{2^n}} \right)$$

$$409. \quad \lim_{n \rightarrow \infty} \left(1 - \frac{1}{2^2} \right) \left(1 - \frac{1}{3^2} \right) \times \cdots \times \left(1 - \frac{1}{n^2} \right)$$

$$410. \quad \lim_{n \rightarrow \infty} (1+x) (1+x^2) (1+x^4) \times \cdots \times (1+x^{2^n}) \quad , \quad |x| < 1$$

$$411. \quad \lim_{n \rightarrow \infty} \left[\frac{1}{1 \times 4 \times 7} + \frac{1}{4 \times 7 \times 10} + \cdots + \frac{1}{(3n-2)(3n+1)(3n+4)} \right]$$

$$412. \quad \lim_{n \rightarrow \infty} \frac{1}{\sqrt{n}} \left(\frac{1}{\sqrt{3}+1} + \frac{1}{\sqrt{5}+\sqrt{3}} + \cdots + \frac{1}{\sqrt{2n+1}+\sqrt{2n-1}} \right)$$

$$413. \quad \lim_{n \rightarrow \infty} \left[\frac{1}{1 \times 2} + \frac{1}{2 \times 3} + \cdots + \frac{1}{n(n+1)} \right]$$

$$414. \quad \lim_{n \rightarrow \infty} \frac{(n+2)! + n!}{(n+2)! + (n+1)!}$$

$$415. \quad \lim_{n \rightarrow \infty} \left[\frac{1}{2!} + \frac{2}{3!} + \cdots + \frac{n}{(n+1)!} \right]$$

$$416. \quad \lim_{n \rightarrow \infty} \left(\frac{1^3 + 2^3 + \cdots + n^3}{n^3} - \frac{n}{4} \right)$$

$$417. \quad \lim_{x \rightarrow \infty} \frac{\sqrt{x + \sqrt{x + \sqrt{x}}} + \sqrt{x}}{\sqrt{x + \sqrt{x}} + \sqrt{x}}$$

$$418. \quad \lim_{x \rightarrow 1} \frac{x^{n+1} - (n+1)x + n}{x^{p+1} - x^p - x + 1}$$

$$419. \quad \lim_{x \rightarrow 1} \frac{x + 2x^2 + 3x^3 + \cdots + nx^n - \frac{n(n+1)}{2}}{x-1}$$

$$420. \quad \lim_{x \rightarrow 1} \left(\frac{1}{1-x} - \frac{n+1}{1-x^{n+1}} \right)$$

$$421. \quad \lim_{x \rightarrow 0^+} (\sin x)^{\frac{1}{\ln[e^x - \ln(e+x)]}}$$

$$422. \quad \lim_{x \rightarrow +\infty} \left[\sqrt[3]{x^3 + x^2 + x + 1} \cdot \frac{\ln(e^x + x + \sin x)}{x} - \sqrt{x^2 + 1} \cdot \frac{\ln(e^x + x \sin x + 1)}{x+1} \right]$$

$$423. \quad \lim_{x \rightarrow 1} \frac{x^x - 1}{x-1}$$

$$424. \quad \lim_{n \rightarrow \infty} \frac{(2 \cdot \sqrt[n]{n} - 1)^n}{n^2}$$

$$425. \quad \lim_{x \rightarrow 0} \left[\frac{\pi^{\frac{\ln(1+\sin x)}{\tan x}} - 1}{\tan x} \cdot x^{\frac{1}{\ln(e^{\sin x} - 1)}} \right]$$

$$426. \quad \lim_{x \rightarrow 0} \frac{1 - \cos(1 - \cos x)}{x^4}$$

$$427. \quad \lim_{x \rightarrow \infty} x \left[\operatorname{Arc} \tan \left(\frac{x+1}{x+2} \right) - \operatorname{Arc} \tan \left(\frac{x}{x+2} \right) \right]$$

$$428. \quad \lim_{x \rightarrow 0} \frac{\operatorname{Arc} \sin x - \operatorname{Arc} \tan x}{x^2}$$

$$429. \quad \lim_{x \rightarrow 0} \left(\frac{\sin x}{x} \right)^{\frac{\sin x}{x - \sin x}}$$

$$430. \quad \lim_{x \rightarrow -\infty} \frac{\ln(1 + 3^x)}{\ln(1 + 2^x)}$$

$$431. \quad \lim_{x \rightarrow +\infty} \ln(1 + 2^x) \cdot \ln\left(1 + \frac{3}{x}\right)$$

$$432. \quad \lim_{x \rightarrow 0} \frac{\ln(x^2 + e^x)}{\ln(x^4 + e^{2x})}$$

$$433. \quad \lim_{x \rightarrow +\infty} \frac{\ln(x^2 + e^x)}{\ln(x^4 + e^{2x})}$$

$$434. \quad \lim_{x \rightarrow 0} \frac{\tan 2x \cdot \operatorname{Arc} \sin 3x}{\sin 3x \cdot \operatorname{Arc} \tan 2x}$$

$$435. \quad \lim_{x \rightarrow +\infty} \frac{\tan^3 \frac{1}{x} \cdot \operatorname{Arc} \tan \left(\frac{3}{x\sqrt{x}} \right)}{\sin \frac{2}{x^3} \cdot \tan \frac{1}{\sqrt{x}} \cdot \operatorname{Arc} \sin \frac{5}{x}}$$

$$436. \quad \lim_{x \rightarrow +\infty} \left[(x+2) \cdot \ln(x+2) - 2(x+1) \cdot \ln(x+1) + x \ln x \right]$$

$$437. \quad \lim_{x \rightarrow +\infty} \frac{(x+a)^{x+a} \cdot (x+b)^{x+b}}{(x+a+b)^{2x+a+b}}$$

$$438. \quad \lim_{x \rightarrow 0^+} \ln(x \ln a) \cdot \ln \left(\frac{\ln ax}{\ln \frac{x}{a}} \right), \quad a > 1$$

$$439. \quad \lim_{x \rightarrow +\infty} \left(sh \sqrt{x^2 + x} - sh \sqrt{x^2 - x} \right)$$

$$440. \quad \lim_{x \rightarrow +\infty} \left[sh(chx) - ch(shx) \right]$$

$$441. \quad \lim_{x \rightarrow +\infty} \left(ch \sqrt{1+x} - ch \sqrt{x} \right)^{\frac{1}{\sqrt{x}}}$$

$$442. \quad \lim_{x \rightarrow +\infty} \left[(e^x + x)^{e^x - x^2} - (e^x + x^2)^{e^x - x} \right]$$

$$443. \quad \lim_{x \rightarrow +\infty} \left[(x+1)^{(x+1)^{\frac{1}{x+1}}} - x^{x^{\frac{1}{x}}} \right]$$

$$444. \quad \lim_{x \rightarrow 0} \frac{3 \tan 4x - 4 \tan 3x}{3 \sin 4x - 4 \sin 3x}$$

$$445. \quad \lim_{x \rightarrow 0} \frac{\sin 3x + 4 \sin^3 x - 3 \ln(1+x)}{(e^x - 1) \cdot \sin x}$$

$$446. \quad \lim_{x \rightarrow 0} \frac{x(e^x + 1) - 2(e^x - 1)}{x^3}$$

$$447. \quad \lim_{x \rightarrow 0} \frac{\ln\left(\frac{1+x}{1-x}\right)}{\operatorname{Arc} \tan(1+x) - \operatorname{Arc} \tan(1-x)}$$

$$448. \quad \lim_{x \rightarrow 0} \frac{[\ln(chx) - \ln(\cos x)]^2}{\sqrt{chx} + \sqrt{\cos x} - 2}$$

$$449. \quad \lim_{x \rightarrow 0} \frac{\operatorname{Arc} \tan[x^2(1 - \cos x)]}{(1 - \cos \sqrt{x}) \cdot \ln\left(\frac{\sin x}{x}\right)}$$

$$450. \quad \lim_{x \rightarrow +\infty} \frac{\ln(x + \sqrt{x^2 + 1}) - \ln(x + \sqrt{x^2 - 1})}{\left[\ln\left(\frac{x+1}{x-1}\right)\right]^2}$$

$$451. \quad \lim_{x \rightarrow 0} \left[\frac{1}{x} - \frac{1}{\ln(1+x)} \right]$$

$$452. \quad \lim_{x \rightarrow 0} \left[\frac{2}{\sin^2 x} - \frac{1}{\ln(\cos x)} \right]$$

$$453. \quad \lim_{x \rightarrow 0} \frac{1}{\sin^4 x} \left[\sin\left(\frac{x}{1+x}\right) - \frac{\sin x}{1 + \sin x} \right]$$

$$454. \quad \lim_{x \rightarrow 1} \left(\frac{1}{1-x^a} - \frac{1}{1-x^b} \right), \quad (a, b) \in (\mathbb{R}^*)^2$$

$$455. \quad \lim_{x \rightarrow 1} \frac{ax^{a+1} - (a+1)x^a + 1}{x^{b+1} - x^b - x + 1}, \quad (a, b) \in \mathbb{R} \times \mathbb{R}^*$$

$$456. \quad \lim_{x \rightarrow 0} \frac{x^x - \left(\frac{x}{2}\right)^{2x}}{x^{\sin x} - \left(\frac{x}{2}\right)^{\sin 2x}}$$

$$457. \quad \lim_{x \rightarrow 2} \left(2^x + 3^x - 12 \right)^{\tan \frac{\pi x}{4}}$$

$$458. \quad \lim_{x \rightarrow 3} \left(9^x + 10^x - 12^x \right) \left(4^{x-1} + 7^{x-1} - 8^{x-1} - 1 \right)^{-1}$$

$$459. \quad \lim_{x \rightarrow 0} \frac{(1 + \sin x)^{\frac{1}{x}} - e^{1 - \frac{x}{2}}}{(1 + \tan x)^{\frac{1}{x}} - e^{1 - \frac{x}{2}}}$$

$$460. \quad \lim_{x \rightarrow 0^+} \left(th \frac{1}{x} - \frac{1}{ch \frac{1}{x}} \right)^{\frac{1}{x}}$$

$$461. \quad \lim_{x \rightarrow +\infty} \ln x \cdot \left\{ \left[\frac{\ln(x+1)}{\ln x} \right]^x - 1 \right\}$$

$$462. \quad \lim_{x \rightarrow +\infty} \left[e - \left(1 + \frac{1}{x} \right)^x \right]^{\sqrt{x^2+2} - \sqrt{x^2+1}}$$

$$463. \quad \lim_{x \rightarrow 0} \sqrt[x]{\cos \sqrt{x}}$$

$$464. \quad \lim_{n \rightarrow +\infty} \frac{(-1)^n}{n}$$

$$465. \quad \lim_{n \rightarrow +\infty} \frac{\sin n}{n}$$

$$466. \quad \lim_{n \rightarrow +\infty} \frac{\cos n}{n}$$

$$467. \quad \lim_{x \rightarrow a} \left(1 + a e^x - x e^a \right)^{\frac{1}{x-a}}$$

$$468. \quad \lim_{x \rightarrow a} (1 + x \ln a - a \ln x)^{\frac{1}{x-a}}$$

$$469. \quad \lim_{n \rightarrow \pm \infty} \left(\frac{a-1+\sqrt[n]{b}}{a} \right)^n$$

$$470. \quad \lim_{x \rightarrow 0} \left[\frac{1 - \cos(x\sqrt{2})}{x^2} \right]^{-\frac{12}{1-\cos x}}$$

$$471. \quad \lim_{x \rightarrow a} \left(\frac{a \csc x}{x \csc a} \right)^{\frac{1}{x-a}}$$

$$472. \quad \lim_{x \rightarrow 0} \left(\frac{a_1^x + a_2^x + \cdots + a_n^x}{n} \right)^{\frac{1}{x}}$$

$$473. \quad \lim_{n \rightarrow +\infty} \left(\cos \frac{1}{n} \right)^{n^3+2n^2}$$

$$474. \quad \lim_{n \rightarrow +\infty} \left(\frac{\sqrt[n]{a} + \sqrt[n]{b}}{2} \right)^n$$

$$475. \quad \lim_{x \rightarrow 0} \left(2e^{\frac{x}{x+1}} - 1 \right)^{\frac{x^2+1}{x}}$$

$$476. \quad \lim_{x \rightarrow +\infty} \left[\sin \left(\frac{\pi x + 4}{2x + 3} \right) \right]^{\frac{x^2}{1+2x}}$$

$$477. \quad \lim_{x \rightarrow 0^+} \left(2 \sin \sqrt{x} + \sqrt{x} \sin \frac{1}{x} \right)^x$$

$$478. \quad \lim_{x \rightarrow 0} \left(1 + x e^{-\frac{1}{x^2}} \cdot \sin \frac{1}{x^4} \right)^{e^{-\frac{1}{x^2}}}$$

$$479. \quad \lim_{x \rightarrow 0} \left(1 + e^{-\frac{1}{x^2}} \cdot \text{Arc tan } \frac{1}{x^2} + x e^{-\frac{1}{x^2}} \cdot \sin \frac{1}{x^4} \right)^{\frac{1}{x^2}}$$

$$480. \quad \lim_{x \rightarrow \pm \infty} \left[(x+1)e^{\frac{1}{x+1}} - x e^{\frac{1}{x}} \right]$$

$$481. \quad \lim_{x \rightarrow 1} \frac{x^{x^{x^{x^x}}} - x^{x^{x^x}}}{(1-x)^5}$$

$$482. \quad \lim_{x \rightarrow 0} \frac{\left(2 \tan \frac{x}{2} - x \right) + x \tan^2 \frac{x}{2}}{\left(2 \tan \frac{x}{2} - x \right) - x \tan^2 \frac{x}{2}}$$

$$483. \quad \lim_{x \rightarrow 0} \frac{x(e^x + 1) - 2(e^x - 1)}{x^3}$$

$$484. \quad \lim_{x \rightarrow 0} \frac{\text{Arc sin}(2x) - 2 \text{Arc sin } x}{x^3}$$

$$485. \quad \lim_{x \rightarrow 1} \frac{x^x - x}{\ln x - x + 1}$$

$$486. \quad \lim_{n \rightarrow \infty} \frac{13 - \frac{1}{\sqrt{n}} + \frac{(-1)^n}{n}}{n + 5 \cdot 2^{-n}}$$

$$487. \quad \lim_{x \rightarrow a} \frac{\sqrt[3]{x} - \sqrt[3]{a}}{\sqrt[4]{x} - \sqrt[4]{a}}$$

$$488. \quad \lim_{x \rightarrow \infty} \frac{\sqrt[4]{x} - \sqrt[6]{x}}{\sqrt[8]{x} - \sqrt[12]{x}}$$

$$489. \quad \lim_{x \rightarrow 4} \frac{8\sqrt{x} - x^2}{8 - 4\sqrt{x}}$$

$$490. \quad \lim_{x \rightarrow 0} \frac{\sqrt{1+x} - \sqrt{1-x}}{\sqrt[3]{1+x} - \sqrt[3]{1-x}}$$

$$491. \quad \lim_{x \rightarrow \frac{\pi}{2}} \frac{\cos x}{\sin 2x}$$

$$492. \quad \lim_{x \rightarrow 0^+} \frac{1}{x} \int_0^x \cos 2t \, dt$$

$$493. \quad \lim_{x \rightarrow 1} \frac{1}{x-1} \int_1^x \frac{e^{t^2}}{\cos(\pi t)} \, dt$$

$$494. \quad \lim_{x \rightarrow a^+} \frac{\cos x \cdot \ln(x-a)}{\ln(e^x - e^a)}$$

$$495. \quad \lim_{x \rightarrow a} \left[\frac{1}{2} \left(\sqrt{\frac{a}{x}} + \sqrt{\frac{x}{a}} \right) \right]^{\frac{1}{x-a}}$$

$$496. \quad \lim_{x \rightarrow 0} \frac{e^x \sin x - x - x^2}{x^3}$$

$$497. \quad \lim_{x \rightarrow \frac{\pi}{2}} \frac{\sin(x \cos x)}{\cos(x \sin x)}$$

$$498. \quad \lim_{x \rightarrow 0} \frac{\sin x^2 - x^2}{2x^6}$$

$$499. \quad \lim_{x \rightarrow 0} \frac{x - \ln(1+x)}{x^2}$$

$$500. \quad \lim_{x \rightarrow 0} \frac{\sin x - x + \frac{1}{6}x^3}{x^5}$$

$$501. \quad \lim_{n \rightarrow \infty} \left(\frac{2^3-1}{2^3+1} \times \frac{3^3-1}{3^3+1} \times \dots \times \frac{n^3-1}{n^3+1} \right)$$

$$502. \quad \lim_{n \rightarrow +\infty} \sin \left(\frac{n\pi}{3e \cdot \sqrt[n]{n!}} \right)$$

$$503. \quad \lim_{n \rightarrow \infty} \frac{1+3+5+\dots+(2n-1)}{2+4+6+\dots+2n}$$

$$504. \quad \lim_{n \rightarrow +\infty} \left(\frac{1}{n+1} + \frac{1}{n+2} + \cdots + \frac{1}{n+n} \right)$$

$$505. \quad \lim_{n \rightarrow +\infty} \frac{1}{n} \left(\tan \frac{a}{n} + \tan \frac{2a}{n} + \cdots + \tan \frac{na}{n} \right)$$

$$506. \quad \lim_{n \rightarrow +\infty} \left(\frac{n}{n^2+1} + \frac{n}{n^2+4} + \cdots + \frac{n}{n^2+n^2} \right)$$

$$507. \quad \lim_{n \rightarrow +\infty} \left(\frac{1}{\sqrt{n^2+1}} + \frac{1}{\sqrt{n^2+4}} + \cdots + \frac{1}{\sqrt{n^2+n^2}} \right)$$

$$508. \quad \lim_{n \rightarrow +\infty} \left\{ \frac{1^3 + 2^3 + \cdots + n^3}{n(n+1)^2} \times \cos \left[\frac{(1+2+\cdots+n)\pi}{n^2} \right] \right\}$$

$$509. \quad \lim_{x \rightarrow \frac{\pi}{2}} \frac{\cos x}{\pi^2 - 4x^2}$$

$$510. \quad \lim_{n \rightarrow +\infty} \left[\frac{1^2 + 2^2 + \cdots + n^2}{2n^2 + 3n + 1} \times \tan \left(\frac{2\pi}{n^2} \times \sqrt{1^3 + 2^3 + \cdots + n^3} \right) \right]$$

$$511. \quad \lim_{x \rightarrow \pi} \frac{\cos \left(\frac{\pi x}{x + \pi} \right)}{\pi - x}$$

$$512. \quad \lim_{x \rightarrow \infty} \left[\cos \left(\frac{\pi x + 1}{2x + 3} \right) \times \tan \left(\frac{\pi x - 1}{2x - 3} \right) \right]$$

$$513. \quad \lim_{n \rightarrow +\infty} \sum_{k=1}^n \left[\frac{\sqrt{k+1} - \sqrt{k} + 1}{(\sqrt{k} + k)(\sqrt{k+1} + k + 1)} \right]$$

$$514. \quad \lim_{x \rightarrow \infty} x \sin \frac{1}{x}$$

$$515. \quad \lim_{x \rightarrow \infty} \frac{x + \sin x}{x + \cos x}$$

$$516. \quad \lim_{n \rightarrow +\infty} \left\{ \frac{n^2 + n + 1}{n + 2} \times \tan \left[\frac{(2 + 4 + \cdots + 2n)\pi}{(n+1)^2} \right] \right\}$$

$$517. \quad \lim_{n \rightarrow +\infty} \left\{ (n+1) \times \sin \left[\frac{(1+2+\dots+n)\pi}{2n^2+n} \right] \right\}$$

$$518. \quad \lim_{n \rightarrow +\infty} \left\{ (n+3) \times \cos \left[\frac{(1^2+2^2+\dots+n^2)}{n(n+1)(n+2)} \times \frac{3\pi}{4} \right] \right\}$$

$$519. \quad \lim_{n \rightarrow +\infty} \left(\frac{n}{\sqrt{n^4+1}} + \frac{n}{\sqrt{n^4+2}} + \dots + \frac{n}{\sqrt{n^4+n}} \right)$$

$$520. \quad \lim_{n \rightarrow +\infty} \left[n \cdot \left(\frac{4}{5} \right)^n + n^2 \cdot \sin^n \left(\frac{\pi}{6} \right) + \cos \left(2n\pi + \frac{\pi}{n} \right) \right]$$

$$521. \quad \lim_{n \rightarrow +\infty} \sqrt[n]{\frac{3^{3n} \cdot (n!)^3}{(3n)!}}$$

$$522. \quad \lim_{n \rightarrow +\infty} \frac{a + \sqrt{a} + \sqrt[3]{a} + \dots + \sqrt[n]{a} - n}{\ln n}$$

$$523. \quad \lim_{n \rightarrow +\infty} n \cdot \ln \left[\tan \left(\frac{\pi}{4} + \frac{\pi}{n} \right) \right]$$

$$524. \quad \lim_{n \rightarrow \infty} \sum_{k=1}^n \left[\operatorname{Arc} \tan \left(\frac{1}{k^2+k+1} \right) \right]$$

$$525. \quad \lim_{n \rightarrow \infty} \left[\cos \left(\pi n \cdot \sqrt[3]{n^3+3n^2+n+1} \right) + \sin \left(\pi n \cdot \sqrt[3]{n^3+3n^2+n+1} \right) \right]$$

$$526. \quad \lim_{n \rightarrow \infty} \sum_{k=1}^n \frac{k^4 + 10k^3 + 35k^2 + 50k + 23}{(k+4)!}$$

$$527. \quad \lim_{n \rightarrow +\infty} \left[\sqrt[n]{(x+1)(x+2) \times \dots \times (x+n)} - x \right], \quad (n \in \mathbb{N}^*)$$

$$528. \quad \lim_{n \rightarrow +\infty} \left(\frac{1}{1+\sqrt{n}} + \frac{2}{1+\sqrt{2n}} + \dots + \frac{n}{1+n} \right)$$

$$529. \quad \lim_{n \rightarrow +\infty} \frac{n + (-1)^n}{2n}$$

$$530. \quad \lim_{x \rightarrow \pm \infty} \frac{\left(x - \sqrt{x^2 - 1} \right)^n - \left(x + \sqrt{x^2 - 1} \right)^n}{x^n}$$

$$531. \quad \lim_{x \rightarrow 0} \frac{n - \cos x - \cos^2 x - \dots - \cos^n x}{x^2}$$

$$532. \quad \lim_{x \rightarrow 0} \frac{8^x - 7^x}{6^x - 5^x}$$

$$533. \quad \lim_{x \rightarrow 0} \frac{(x+1)! - 1}{e^x - 1 - x}$$

$$534. \quad \lim_{x \rightarrow 0} \frac{(mx+n)! - n!}{(nx+m)! - m!}$$

$$535. \quad \lim_{n \rightarrow \infty} \left\{ \cos \left[\ln(n+1) - \ln(n-1) \right] \right\}^{(n+1)^2}$$

$$536. \quad \lim_{x \rightarrow 1} \frac{5x^4 - 10x^2 + 6 + \cos(\pi x)}{(x-1) \cdot \sin(\pi x)}$$

$$537. \quad \lim_{n \rightarrow \infty} \sum_{k=1}^n \ln \left(\sqrt[n]{1 + \frac{k}{n}} \right)$$

$$538. \quad \lim_{n \rightarrow \infty} \sqrt[n]{\left(\frac{2 \times 1 + 1}{2 \times 1 + 3} \right)^{1^2} \times \left(\frac{2 \times 2 + 1}{2 \times 2 + 3} \right)^{2^2} \times \dots \times \left(\frac{2 \times n + 1}{2 \times n + 3} \right)^{n^2}}$$

$$539. \quad \lim_{n \rightarrow \infty} \frac{n}{\frac{1}{\sqrt{2} - \sqrt{1}} + \frac{1}{\sqrt{3} - \sqrt{2}} + \dots + \frac{1}{\sqrt{n+1} - \sqrt{n}}}$$

$$540. \quad \lim_{x \rightarrow 0} \left(\frac{1 + x \cdot 2^x}{1 + x \cdot 3^x} \right)^{\frac{1}{x^2}}$$

$$541. \quad \lim_{x \rightarrow 0} \frac{\frac{x^6}{6} + 120 \cos x - 5x^4 + 60x^2 - 120}{x^8}$$

$$542. \quad \lim_{n \rightarrow +\infty} n^n \cdot \sin^n \left(\frac{1}{n} \right)$$

$$543. \quad \lim_{x \rightarrow 0} \frac{\frac{x^6}{6} + 120 \cos x - 5x^4 + 60x^2 - 120}{x^8}$$

$$544. \quad \lim_{x \rightarrow \frac{\pi}{12}} \frac{\cos x - \sin x - \sin \frac{\pi}{4}}{\sin 3x - \sin \frac{\pi}{4}}$$

$$545. \quad \lim_{x \rightarrow 0} \frac{2 \sin x - \sin 2x}{x - \sin x}$$

$$546. \quad \lim_{x \rightarrow 0} \left[\ln(x^2 + e) \right]^{\frac{1}{\cos x - 1}}$$

$$547. \quad \lim_{n \rightarrow \infty} \frac{\ln(1 + n \cdot 2^n)}{2n}$$

$$548. \quad \lim_{n \rightarrow \infty} \left\{ n - n^2 \cdot \left[\int_0^{\frac{\pi}{4}} (\cos x - \sin x)^n dx \right] \right\}$$

$$549. \quad \lim_{n \rightarrow \infty} \frac{1}{n} \left(\frac{n}{\frac{1}{2} + \frac{2}{3} + \dots + \frac{n}{n+1}} \right)^n$$

$$550. \quad \lim_{n \rightarrow \infty} \frac{1}{3n+1} \sum_{k=2}^n \left(\frac{1}{\sqrt[k]{k!}} \right)$$

$$551. \quad \lim_{n \rightarrow \infty} \frac{n(n+1)(n+2) \times \dots \times (2n-2) \times \text{Arc tan} \left(\frac{\pi}{2^n} \right)}{1 \times 3 \times 5 \times \dots \times (2n-3)}$$

$$552. \quad \lim_{n \rightarrow \infty} \frac{1}{n^4} \sum_{m=1}^{n-1} \left[m \cdot \left(\sum_{p=m+1}^n p \right) \right]$$

$$553. \quad \lim_{n \rightarrow \infty} \left[{}^{n+1}\sqrt{(n+1)!} - {}^n\sqrt{n! \times \left(1 + \frac{1}{1!} + \frac{1}{2!} + \dots + \frac{1}{n!} \right)} \right]$$

$$554. \quad \lim_{n \rightarrow \infty} {}^{n^2}\sqrt{2!! \times \sqrt{3!!} \times \sqrt[3]{5!!} \times \dots \times {}^n\sqrt{(2n-1)!!}}$$

$$555. \quad \lim_{n \rightarrow \infty} \sum_{k=1}^n \left[\frac{(n-k+1) \cdot e^{-k^2}}{1+2+\dots+n} \right]$$

$$556. \quad \lim_{n \rightarrow \infty} \left[\frac{\pi^2}{6} - \left(\frac{1}{2^2} + \frac{1}{3^2} + \dots + \frac{1}{n^2} \right) \right]^n$$

$$557. \quad \lim_{x \rightarrow \infty} x \left[\left(1 + \frac{1}{x} \right)^x - e \right]$$

$$558. \quad \lim_{n \rightarrow \infty} \frac{n!}{(1+1^2)(1+2^2) \times \dots \times (1+n^2)}$$

$$559. \quad \lim_{n \rightarrow +\infty} \sum_{k=1}^{n+1} \operatorname{Arc} \tan \left(\frac{1}{2k^2} \right)$$

$$560. \quad \lim_{n \rightarrow +\infty} \frac{1-2+3-4+\dots+(2n-1)-2n}{\sqrt{n^2+1}}$$

$$561. \quad \lim_{n \rightarrow +\infty} \left(\sqrt{2} \times \sqrt[4]{2} \times \dots \times \sqrt[2^n]{2} \right)$$

$$562. \quad \lim_{n \rightarrow +\infty} \frac{1^2+3^2+\dots+(2n-1)^2}{2^2+4^2+\dots+(2n)^2}$$

$$563. \quad \lim_{n \rightarrow +\infty} \frac{1^3+4^3+\dots+(3n-2)^3}{[1+4+\dots+(3n-2)]^2}$$

$$564. \quad \lim_{n \rightarrow +\infty} \frac{(x+1)(x^2+1) \times \dots \times (x^n+1)}{\left[(nx)^n - 1 \right]^{\frac{n+1}{2}}}$$

$$565. \quad \lim_{n \rightarrow +\infty} \sum_{k=1}^n \left(\frac{1}{k^3+6k^2+11k+6} \right)$$

$$566. \quad \lim_{x \rightarrow +\infty} \left(\sqrt{x+\sqrt{x+\sqrt{x}}} - \sqrt{x-\sqrt{x-\sqrt{x}}} \right)$$

$$567. \quad \lim_{n \rightarrow +\infty} \left(\sin^3 \frac{\alpha}{3} + 3 \sin^3 \frac{\alpha}{3^2} + \dots + 3^{n-1} \sin^3 \frac{\alpha}{3^n} \right)$$

$$568. \quad \lim_{x \rightarrow \pm\infty} \frac{a^x - a^{-x}}{a^x + a^{-x}}, \quad (a > 0)$$

$$569. \quad \lim_{n \rightarrow \infty} \frac{\sqrt[n]{n!}}{n}$$

$$570. \quad \lim_{n \rightarrow \infty} \frac{C_{2n}^2 \times C_{3n}^3}{C_{5n}^5}$$

$$571. \quad \lim_{n \rightarrow +\infty} \frac{4 + 4C_n^1 + 4^2 C_n^2 + \dots + 4^n}{5 + 4C_n^1 + 4^2 C_n^2 + \dots + 4^n}$$

$$572. \quad \lim_{x \rightarrow 0} \frac{e^x - x - 1}{x^2}$$

$$573. \quad \lim_{n \rightarrow \infty} \left[(q-1) + q^2 (q^2 - q) + \dots + q^{2(n-1)} (q^n - q^{n-1}) \right]$$

$$574. \quad \lim_{n \rightarrow +\infty} \frac{3^n}{4^n - 2^n}$$

$$575. \quad \lim_{x \rightarrow \infty} \frac{\cos x}{1 + x^2}$$

$$576. \quad \lim_{n \rightarrow \infty} \frac{n \times \sin(n!)}{n^2 + 1}$$

$$577. \quad \lim_{n \rightarrow +\infty} \frac{1^p + 2^p + \dots + n^p}{n^{p+1}}$$

$$578. \quad \lim_{n \rightarrow +\infty} \left[\frac{1}{n \left(3 + \cos \frac{1}{n} - \sin \frac{1}{n} \right)} + \frac{1}{n \left(3 + \cos \frac{2}{n} - \sin \frac{2}{n} \right)} + \dots + \frac{1}{n \left(3 + \cos \frac{n}{n} - \sin \frac{n}{n} \right)} \right]$$

$$579. \quad \lim_{x \rightarrow 0} \frac{8x^3 - 5x^2 \cdot \text{Arc sin } x + 2 \cdot (\text{Arc sin } x)^3}{6x^3 + 7x \cdot (\text{Arc sin } x)^2 - 5 \cdot (\text{Arc sin } x)^3}$$

$$580. \quad \lim_{x \rightarrow +\infty} \sin \left\{ 2 \text{Arccot} \left[\cos(\text{Arctan } x) \right] \right\}$$

$$581. \quad \lim_{n \rightarrow \infty} \frac{\left[\sqrt[n+1]{(n+1)!} \right]^{m+p+1} - \left(\sqrt[n]{n!} \right)^{m+p+1}}{n^m \cdot \left[\sqrt[n]{(2n-1)!!} \right]^p}, \quad m, p \geq 0$$

$$582. \quad \lim_{n \rightarrow \infty} \frac{\left[\sqrt[n+1]{(2n+1)!!} \right]^m - \left[\sqrt[n]{(2n-1)!!} \right]^m}{n^{m-p} \cdot \left\{ \left[\sqrt[n+1]{(n+1)!} \right]^p - \left(\sqrt[n]{n!} \right)^p \right\}}, \quad m, p \in \mathbb{N}^*, m \geq p$$

$$583. \quad \lim_{n \rightarrow \infty} \sum_{k=1}^n \left\{ \left[\sum_{i=1}^k (4i-1) \right]^{-1} \right\}$$

$$584. \quad \lim_{x \rightarrow 0} \left(\frac{a_1^{\sqrt[n]{x}} + a_2^{\sqrt[n]{x}} + \dots + a_p^{\sqrt[n]{x}}}{a_1^{\sqrt[m]{x}} + a_2^{\sqrt[m]{x}} + \dots + a_p^{\sqrt[m]{x}}} \right)^{\frac{1}{\sqrt[n]{x} + \sqrt[m]{x}}}, \quad (m, n, p) \in \mathbb{N}^3, m, n, p \geq 2, a_i > 0, a_i \neq 1, i \in \overline{1, p}$$

$$585. \quad \lim_{p \rightarrow \infty} \left\{ \lim_{n \rightarrow \infty} \left[\prod_{k=1}^n \left(1 + \frac{(1+k)^p}{n^{p+1}} \right) \right] \right\}^p, \quad p > 0$$

$$586. \quad \lim_{n \rightarrow \infty} \left[\sqrt[n+1]{\frac{(n+1)!}{I_{n+1}}} - \sqrt[n]{\frac{n!}{I_n}} \right], \quad I_n = \int_0^{\frac{\pi}{2}} (e^{-x} \cdot \sin^n x) dx, \quad n \in \mathbb{N}$$

$$587. \quad \lim_{n \rightarrow \infty} \left[\sqrt[4]{(2n+3)^3 \cdot (n+1)!} - \sqrt[4]{(2n+1)^3 \cdot n!} \right]$$

$$588. \quad \lim_{n \rightarrow \infty} \left[\sqrt[n]{n! \times \prod_{k=1}^n \left(\sqrt[k]{1 + \frac{1}{2^k}} - 1 \right)} \right]$$

$$589. \quad \lim_{x \rightarrow 0} \left\{ \frac{x^2 \sec x \cdot \sqrt{x^2 - x^2 \cos x}}{\left[x \cdot \sqrt{\tan \left(x + \frac{\pi}{4} \right)} + x \tan \sqrt{x} \right]^4} \right\}^{\frac{x}{\sin \frac{x}{2}}}$$

$$590. \quad \lim_{n \rightarrow \infty} \left\{ (4n+3) \int_{\frac{\pi}{2}}^{\frac{5\pi}{2}} \frac{\cos[(4n+3)x]}{x^2} dx \right\}$$

$$591. \quad \lim_{n \rightarrow \infty} \left[\frac{1}{n} \int_0^1 \log(1 + e^{n \sin x}) dx \right]$$

$$592. \quad \lim_{p \rightarrow \infty} \left[\lim_{n \rightarrow \infty} \left(\sum_{k=1}^n \frac{k^{p-1}}{n^{p-1} \cdot \sqrt[p]{n^p + k^p}} \right) \right], \quad p \in \mathbb{N}, \quad p \geq 1$$

$$593. \quad \lim_{n \rightarrow \infty} \left(\frac{n-1}{n^n} \sum_{k=1}^{n-1} k^k \right)$$

$$594. \quad \lim_{x \rightarrow +\infty} \left(x \cdot \sqrt[n]{\frac{x+a}{x+b}} - x \right)$$

$$595. \quad \lim_{x \rightarrow 0} \frac{\sin \left[\frac{\pi}{2} \cos \left(1 - \frac{x}{\sin x} \right) \right] - 1}{\ln^8(1+x)}$$

$$596. \quad \lim_{x \rightarrow 0} \frac{\sin \left(1 - \frac{\sin x}{x} \right)}{x}$$

$$597. \quad \lim_{x \rightarrow 0} \frac{1 - \cos \left(\frac{1 - \cos x \cdot \cos 2x}{x^2} - \frac{5}{2} \right) \cdot \cos 2x}{x^2}$$

$$598. \quad \lim_{x \rightarrow 0} \frac{x^2 \sin \left(\frac{x}{\sin x} - \frac{\sin x}{x} \right)}{1 - \cos(2 - 2 \cos 2x)}$$

$$599. \quad \lim_{x \rightarrow 0} \frac{1 - \sin \left[\frac{\pi}{2} \cos \left(1 - \frac{\sin x}{x} \right) \right]}{x^8}$$

$$600. \quad \lim_{x \rightarrow 0} \frac{\sin \left(1 - \frac{\tan x}{x} \right)}{\tan \left(1 - \frac{\sin x}{x} \right)}$$

$$601. \quad \lim_{x \rightarrow 0} \frac{\sin \left(1 - \frac{x}{\sin x} \right)}{x \cdot \tan(1 - \cos 2x)}$$

$$602. \quad \lim_{x \rightarrow 0} \frac{1 - \sqrt{1 - \sqrt{1 - \sqrt{1 - x}}}}{\sqrt{x}}$$

$$603. \quad \lim_{x \rightarrow 0} \frac{2^x + 3^x + \dots + 2020^x - 2019}{673^x + 3^x - 2}$$

$$604. \quad \lim_{n \rightarrow \infty} \frac{1^2 - 2^2 + 3^2 - 4^2 + \dots + (2n-1)^2 - (2n)^2}{n^2 - n + 1}$$

$$605. \quad \lim_{x \rightarrow \frac{1}{2}} \frac{\sqrt{3 \operatorname{Arccos} x} - \sqrt{\pi}}{2x^2 - x}$$

$$606. \quad \lim_{x \rightarrow 1} \frac{2 \cdot \sqrt{\operatorname{Arctan} x} - \sqrt{\pi}}{\operatorname{Arctan}(x-1)}$$

$$607. \quad \lim_{n \rightarrow \infty} \frac{1 + (1+2) + (1+2+3) + \dots + (1+2+3+\dots+n)}{1^2 + 2^2 + \dots + n^2}$$

$$608. \quad \lim_{n \rightarrow \infty} \frac{(5n)! \times n^2}{(n!)^5 \times 3125^n}$$

$$609. \quad \lim_{x \rightarrow 1^-} \prod_{n=0}^{\infty} \left[\left(\frac{1+x^{n+1}}{1+x^n} \right)^{x^n} \right]$$

$$610. \quad \lim_{n \rightarrow +\infty} \sum_{i=1}^n \sum_{j=1}^n \frac{i^2 \cdot j}{3^i (i3^j + j3^i)}$$

$$611. \quad \lim_{x \rightarrow +\infty} \frac{\sqrt[3]{x^4} - \sqrt[7]{x^5} + 2 \cdot \sqrt[4]{x^7} + 8 \cdot \sqrt[3]{x^2} - 4x}{2 \cdot \sqrt[4]{x^5} - 5 \cdot \sqrt[3]{x^4} + 3 \cdot \sqrt[4]{x^7} + \sqrt[3]{x^2} - 13}$$

$$612. \quad \lim_{x \rightarrow e} \frac{3 - \ln(\ln x) - 3 \cos(1 - \ln x)}{x^6 + 4x^2 + 3x^3 + x - e^6 - 4e^2 - 3e^3 - e}$$

$$613. \quad \lim_{x \rightarrow 0} x \sin \frac{\pi}{x} \cdot \sin \left(\frac{\pi}{\sin \frac{\pi}{x}} \right)$$

$$614. \quad \lim_{x \rightarrow 0} \frac{1}{x} \ln \left(\frac{e^x - 1}{x} \right)$$

$$615. \quad \lim_{n \rightarrow +\infty} \left(\cos \frac{\theta}{2} \times \cos \frac{\theta}{2^2} \times \cdots \times \cos \frac{\theta}{2^n} \right), \quad \theta \in]0, \pi[$$

$$616. \quad \lim_{n \rightarrow +\infty} \left(\frac{1}{2} \tan \frac{\theta}{2} + \frac{1}{2^2} \tan \frac{\theta}{2^2} + \cdots + \frac{1}{2^n} \tan \frac{\theta}{2^n} \right), \quad \theta \in \left] 0, \frac{\pi}{2} \right[$$

$$617. \quad \lim_{n \rightarrow +\infty} \left(\frac{n^{k+1}}{k+1} \right)^{-1} \cdot \left(\sum_{p=1}^n p^k \right)$$

$$618. \quad \lim_{x \rightarrow 0} \left[\frac{n(n+1)}{2x^2} - \frac{\cos x + 2 \cos 2x + \cdots + n \cos nx}{x^2} \right]$$

$$619. \quad \lim_{x \rightarrow 0} \frac{\sin x - x \cos x}{x(1 - \cos x)}$$

$$620. \quad \lim_{x \rightarrow 0} \frac{\tan(a+x) \times \tan(a-x) - \tan^2 a}{x^2}$$

$$621. \quad \lim_{x \rightarrow 0} \frac{(a+x) \times \sin(a+x) - a \sin a}{x}$$

$$622. \quad \lim_{x \rightarrow 0} \frac{\sin(a+2x) - 2 \sin(a+x) + \sin a}{x^2}$$

$$623. \quad \lim_{x \rightarrow 0} \frac{\sin(a+x) - \sin(a-x)}{\tan(a+x) - \tan(a-x)}$$

$$624. \quad \lim_{x \rightarrow 0} \frac{\sin(a+3x) - 3 \sin(a+2x) - \sin a + 3 \sin(a+x)}{x^3}$$

$$625. \quad \lim_{n \rightarrow +\infty} \sum_{k=1}^n \frac{\sqrt{k}}{n\sqrt{n}}$$

$$626. \quad \lim_{n \rightarrow +\infty} \frac{1}{n^2} \sum_{k=1}^{2n} \left[(-1)^k \cdot k^2 \right]$$

$$627. \quad \lim_{n \rightarrow +\infty} \left(\sqrt[n]{n} - 1 \right)^n$$

$$628. \quad \lim_{n \rightarrow \infty} \left(\frac{a_1^{\frac{1}{n}} + a_2^{\frac{1}{n}} + \dots + a_k^{\frac{1}{n}}}{k} \right)^n$$

$$629. \quad \lim_{x \rightarrow \infty} x^2 \left(\sqrt[7]{\frac{x^3 + x}{1 + x^3}} - \cos \frac{1}{x} \right)$$

$$630. \quad \lim_{n \rightarrow \infty} \left[\left(1 + \frac{1}{2} - \frac{2}{3} \right) + \left(\frac{1}{4} + \frac{1}{5} - \frac{2}{6} \right) + \dots + \left(\frac{1}{3n-2} + \frac{1}{3n-1} - \frac{2}{3n} \right) \right]$$

$$631. \quad \lim_{x \rightarrow 2} \frac{x^{2n} - 4^n}{x^2 - 3x + 2}$$

$$632. \quad \lim_{n \rightarrow \infty} \left[\int_0^\infty \frac{dx}{\left(\frac{1}{4} + x^2 \right)^{n+1}} \right]^{\frac{1}{n}}$$

$$633. \quad \lim_{n \rightarrow \infty} (n+2) \int_0^1 x^n \ln(1+x) dx$$

$$634. \quad \lim_{n \rightarrow \infty} \frac{e^{\frac{1}{n}} + 2e^{\frac{2}{n}} + 3e^{\frac{3}{n}} + \dots + ne^{\frac{n}{n}}}{n^2}$$

$$635. \quad \lim_{n \rightarrow \infty} \left(\prod_{k=0}^{2n} C_{2n}^k \right)^{\frac{1}{n(2n+1)}}$$

$$636. \quad \lim_{n \rightarrow \infty} \left(1 + \frac{1}{2^\alpha} + \frac{1}{3^\alpha} + \dots + \frac{1}{n^\alpha} \right)^{\sqrt[n]{n} - 1}, \quad \alpha \in \mathbb{R}$$

$$637. \quad \lim_{n \rightarrow \infty} \frac{\pi + \sqrt{\pi} + \dots + \sqrt[n]{\pi}}{n}$$

$$638. \quad \lim_{x \rightarrow 0} \frac{\pi x - \operatorname{Argsh} \left[\pi x - \pi \sin (ex - e \cdot \operatorname{Arcsin} x) \right]}{x^2 + x - e^x \tan x}$$

$$639. \quad \lim_{x \rightarrow e} \frac{x - e \ln x}{(x - e)^2}$$

$$640. \quad \lim_{x \rightarrow \infty} \left[\frac{x^{x+1}}{(x+1)^x} - \frac{(x-1)^x}{x^{x-1}} \right]$$

$$641. \quad \lim_{n \rightarrow \infty} \frac{n + n^2 + \dots + n^n}{1 + 2^n + 3^n + \dots + n^n}$$

$$642. \quad \lim_{x \rightarrow 1} \frac{x - 2\sqrt{x} - \cos \pi x}{\sin^2 \pi x}$$

$$643. \quad \lim_{x \rightarrow 0} \frac{(x^2 + 2)^2 + \sqrt{1 + x^4} - \sqrt[3]{1 - 2x^4} - 4}{x^2 (1 - \cos x)}$$

$$644. \quad \lim_{x \rightarrow \infty} \frac{x!}{x^x e^{-x} \sqrt{x}}$$

$$645. \quad \lim_{x \rightarrow \infty} x \left(\frac{\sqrt{2\pi x}}{x!} \right)^{\frac{1}{x}}$$

$$646. \quad \lim_{n \rightarrow \infty} \frac{1}{n^2} \left[2 + \frac{3^2}{2} + \dots + \frac{(n+1)^n}{n^{n-1}} \right]$$

$$647. \quad \lim_{n \rightarrow \infty} \frac{\sqrt{(n-1)!}}{(1 + \sqrt{1})(1 + \sqrt{2}) \times \dots \times (1 + \sqrt{n})}$$

$$648. \quad \lim_{n \rightarrow \infty} \left(1 + \sqrt{2 + \sqrt[3]{3 + \dots + \sqrt[n]{n}}} \right)$$

$$649. \quad \lim_{x \rightarrow b} \frac{\sqrt[n]{(x^{x+b})!} - \sqrt[n]{(b^{x+b})!}}{x^3 - b^3}$$

$$650. \quad \lim_{x \rightarrow 0} \frac{\sqrt[3]{1 + \tan x} - \sqrt[3]{1 + \sin x}}{x^3}$$

$$651. \quad \lim_{n \rightarrow +\infty} \left[\frac{3}{1! + 2! + 3!} + \frac{4}{2! + 3! + 4!} + \dots + \frac{n+2}{n! + (n+1)! + (n+2)!} \right]$$

$$652. \quad \lim_{n \rightarrow \infty} \left[\log_{n-1} n \times \log_n (n+1) \times \log_{n+1} (n+2) \times \dots \times \log_{n^k-1} n^k \right]$$

$$653. \quad \lim_{x \rightarrow \infty} \frac{2 \operatorname{Arctan}(x^2) - \pi}{e^{\frac{1}{x^2}} - 1}$$

$$654. \quad \lim_{n \rightarrow \infty} n^2 \left(x^{\frac{1}{n}} - x^{\frac{1}{n+1}} \right), \quad x > 0$$

$$655. \quad \lim_{x \rightarrow 0} \frac{x}{|x-1| - |x+1|}$$

$$656. \quad \lim_{x \rightarrow 0} \left(\sqrt{\frac{1}{x} + \sqrt{\frac{1}{x} + \sqrt{\frac{1}{x}}}} - \sqrt{\frac{1}{x} - \sqrt{\frac{1}{x} - \sqrt{\frac{1}{x}}}} \right)$$

$$657. \quad \lim_{x \rightarrow 0} \frac{e^{\frac{\tan^6 x}{6}} - e^{\frac{\sin^6 x}{6}}}{x^8}$$

$$658. \quad \lim_{x \rightarrow \infty} \frac{\sqrt[x]{x!}}{x}$$

$$659. \quad \lim_{x \rightarrow 0} \frac{(1+x)^{\frac{2+x}{2x}} - e}{x^2}$$

$$660. \quad \lim_{n \rightarrow \infty} \frac{n^x n!}{x(x+1)(x+2) \times \cdots \times (x+n)}$$

$$661. \quad \lim_{x \rightarrow 2} \frac{\sqrt{(x^2 + 2x - 8)(x-2)}}{x^2 - 4}$$

$$662. \quad \lim_{n \rightarrow \infty} \left(\frac{\operatorname{ch} \frac{\pi}{n}}{\cos \frac{\pi}{n}} \right)^{n^2}$$

$$663. \quad \lim_{x \rightarrow a} \frac{a^{a^x} - a^{x^a}}{a^x - x^a}$$

$$664. \quad \lim_{n \rightarrow \infty} \frac{\ln(a^n + b^n + c^n)}{n}, \quad a, b, c > 1$$

$$665. \quad \lim_{x \rightarrow \infty} \left[(n!)^x + 2^{nx} \right]^{\frac{1}{x}}$$

$$666. \quad \lim_{n \rightarrow \infty} \sin^2 \left\{ \pi \sum_{i=1}^n \left[\frac{n+i+1 \sqrt{(n+i+1)!}}{n+i \sqrt{(n+i)!}} \right] \right\}$$

$$667. \quad \lim_{x \rightarrow \infty} x \left[\left(1 + \frac{m}{x} \right)^x - e^m \right]$$

$$668. \quad \lim_{x \rightarrow \infty} \ln \left[x(e^{-x} - 1) \right]$$

$$669. \quad \lim_{x \rightarrow +\infty} x^2 \ln \left(\frac{\frac{1}{x}}{\sin \frac{1}{x}} \right)$$

$$670. \quad \lim_{n \rightarrow \infty} \frac{\log(n!)}{n \log n}$$

$$671. \quad \lim_{n \rightarrow \infty} \cos \left(\frac{n\pi}{2} \right)$$

$$672. \quad \lim_{n \rightarrow \infty} (-1)^n \ln \left[\cos \left(\sin \frac{1}{n+1} \right) \right]$$

$$673. \quad \lim_{n \rightarrow \infty} \left(\frac{1}{a} + \frac{2}{a^2} + \dots + \frac{n}{a^n} \right), \quad a > 1$$

$$674. \quad \lim_{n \rightarrow \infty} \left(\frac{1}{n^2} \sec^2 \frac{1}{n^2} + \frac{2}{n^2} \sec^2 \frac{4}{n^2} + \dots + \frac{n}{n^2} \sec^2 \frac{n^2}{n^2} \right)$$

$$675. \quad \lim_{n \rightarrow \infty} \left[\frac{n}{(n+1) \cdot \sqrt{2n+1}} + \frac{n}{(n+2) \cdot \sqrt{2(2n+2)}} + \dots + \frac{n}{(n+n) \sqrt{n(2n+n)}} \right]$$

$$676. \quad \lim_{n \rightarrow \infty} \frac{1^2 \cdot n + 2^2 \cdot (n-1) + \dots + n^2 \cdot 1}{1^3 + 2^3 + \dots + n^3}$$

$$677. \quad \lim_{n \rightarrow \infty} \frac{\frac{1}{n} - \sin \frac{1}{n}}{\frac{1}{n^2} \sin \frac{1}{n}}$$

$$678. \quad \lim_{n \rightarrow \infty} \frac{1}{n} \left[\frac{(2n)!}{n!} \right]^{\frac{1}{n}}$$

$$679. \quad \lim_{n \rightarrow \infty} \frac{\left(1 + \frac{1}{n}\right)^{n^2}}{e^n}$$

$$680. \quad \lim_{x \rightarrow \infty} \left[\left(\frac{5x^2 + 1}{3x - 1} \right) \sin \frac{1}{x} + \left(\frac{x+1}{x^2} \right) \sin x \right]$$

$$681. \quad \lim_{n \rightarrow \infty} \ln \left[\frac{n - 2na + 1}{n(1 - 2a)} \right]^n, \quad a \neq \frac{1}{2}$$

$$682. \quad \lim_{n \rightarrow \infty} \left[\operatorname{Arctan} \frac{1}{n} \cdot \sum_{k=1}^n \left(\frac{1}{1 + \tan \frac{k}{n}} \right) \right]$$

$$683. \quad \lim_{n \rightarrow \infty} \sum_{k=1}^{4n} \left[\frac{\sqrt{n}}{\sqrt{k} \cdot (3\sqrt{k} + 4\sqrt{n})^2} \right]$$

$$684. \quad \lim_{n \rightarrow \infty} n^{-\frac{1}{2}\left(1 + \frac{1}{n}\right)} \cdot (1^1 \times 2^2 \times 3^3 \times \dots \times n^n)^{\frac{1}{n^2}}$$

$$685. \quad \lim_{x \rightarrow 0} \frac{1 - \cos x \cdot \cos(xe^x) - \sin x \cdot \sin(xe^x)}{x^4}$$

$$686. \quad \lim_{x \rightarrow \infty} x^2 \left[1 - a^{\frac{1}{x}} - b^{\frac{1}{x}} + (ab)^{\frac{1}{x}} \right], \quad a, b > 0$$

$$687. \quad \lim_{n \rightarrow \infty} \sum_{k=1}^n \left\{ \sin \frac{\pi}{2k} - \cos \frac{\pi}{2k} - \sin \left[\frac{\pi}{2(k+2)} \right] + \cos \left[\frac{\pi}{2(k+2)} \right] \right\}$$

$$688. \quad \lim_{n \rightarrow +\infty} \left(C_n^0 \times C_n^1 \times C_n^2 \times \dots \times C_n^n \right)^{\frac{1}{n(n+1)}}, \quad n \in \mathbb{N}^*$$

$$689. \quad \lim_{n \rightarrow +\infty} \sqrt[n]{C_{nb}^n}$$

$$690. \quad \lim_{x \rightarrow 0} \frac{\ln(1+x+x^2) + \ln(1-x+x^2)}{x \sin x}$$

$$691. \quad \lim_{n \rightarrow \infty} \frac{1}{n!} \sum_{k=1}^n k!$$

$$692. \quad \lim_{x \rightarrow \infty} \left[\frac{1}{e} \left(1 + \frac{1}{x} \right)^x \right]^x$$

$$693. \quad \lim_{x \rightarrow \pi} \frac{x^n - \pi^n}{x^m - \pi^m}$$

$$694. \quad \lim_{n \rightarrow \infty} \frac{(1^2 + 2^2 + \dots + n^2)(1^5 + 2^5 + \dots + n^5)}{(1^3 + 2^3 + \dots + n^3)(1^4 + 2^4 + \dots + n^4)}$$

$$695. \quad \lim_{n \rightarrow \infty} \left[\frac{\sin\left(\frac{2n+1}{n\sqrt{n}}\right)}{2n - \frac{\sin\left(\frac{1}{n\sqrt{n}}\right)}{\sin\left(\frac{1}{n\sqrt{n}}\right)}} \right]$$

$$696. \quad \lim_{n \rightarrow \infty} \frac{n + n^2 + n^3 + \dots + n^n}{1^n + 2^n + 3^n + \dots + n^n}$$

$$697. \quad \lim_{x \rightarrow -\pi} \frac{\sin\left(x + \frac{\pi}{2}\right) + \cos(x + \pi)}{x + \pi}$$

$$698. \quad \lim_{x \rightarrow 0} \left[\sin^2\left(\frac{\pi}{2-ax}\right) \right]^{\sec^2\left(\frac{\pi}{2-bx}\right)}$$

$$699. \quad \lim_{x \rightarrow \infty} \left\{ \cos \left[2\pi \left(\frac{x}{1+x} \right)^a \right] \right\}^{x^2}$$

$$700. \quad \lim_{x \rightarrow \sqrt{\pi}} \frac{\sin x^2 - \cos\left(\frac{3x^2}{2}\right)}{\cos\left(\frac{x^2}{2}\right) - \sin(2x^2) \cdot \cos^2(x^2)}$$

$$701. \quad \lim_{x \rightarrow 0} \left[\frac{\cos(\sin^2 x)}{x^2} \right]^{\frac{\ln(1-2x^2)}{\sin 2x}}$$

$$702. \quad \lim_{x \rightarrow 0} \frac{(1 + \sin x)^{\csc x} - e + \left(\frac{\sin x}{2}\right)^e}{\sin^2 x}$$

$$703. \quad \lim_{x \rightarrow 0} \frac{\cos(\sin x) - \cos x}{x^4}$$

$$704. \quad \lim_{x \rightarrow \frac{\pi}{4}} \frac{4\sqrt{2} - (\cos x + \sin x)^5}{1 - \sin 2x}$$

$$705. \quad \lim_{x \rightarrow 0} \frac{\sqrt{1 - \cos x + \sqrt{1 - \cos x + \sqrt{1 - \cos x + \dots}}}}{x^2}$$

$$706. \quad \lim_{n \rightarrow \infty} \left\{ \tan \left[\frac{\pi - 4}{4} + \left(1 + \frac{1}{n}\right)^\alpha \right] \right\}^n, \quad \alpha \in \mathbb{Q}$$

$$707. \quad \lim_{n \rightarrow \infty} \sum_{k=1}^n \left[\frac{k(3k-2)}{n^3} + \frac{k^2(3k-2)}{n^4} \right]$$

$$708. \quad \lim_{n \rightarrow \infty} \frac{\pi}{n} \sum_{k=1}^n \sin \left(\frac{\pi}{2} + \frac{5\pi}{2} \cdot \frac{k}{n} \right)$$

$$709. \quad \lim_{x \rightarrow 0} \frac{x - \sin x}{e^x - 1 - x - \frac{x^2}{2}}$$

$$710. \quad \lim_{x \rightarrow 0} \frac{2(\tan x - \sin x) - x^2}{x^5}$$

$$711. \quad \lim_{x \rightarrow \infty} \left[x - x^2 \ln \left(1 + \frac{1}{x} \right) \right]$$

$$712. \quad \lim_{x \rightarrow 0} \frac{\csc x - \frac{1}{x} - \frac{x}{6}}{x^3}$$

$$713. \quad \lim_{x \rightarrow 0} \frac{\cot x - \frac{1}{x} + \frac{x}{3}}{x^3}$$

$$714. \quad \lim_{x \rightarrow 1} \frac{1 - 4 \sin^2 \left(\frac{\pi x}{6} \right)}{1 - x^2}$$

$$715. \quad \lim_{x \rightarrow 0} \frac{\sin x \cdot \operatorname{Arcsin} x - x^2}{x^6}$$

$$716. \quad \lim_{x \rightarrow 0} \frac{\tan x \cdot \operatorname{Arctan} x - x^2}{x^6}$$

$$717. \quad \lim_{x \rightarrow 0} \frac{\cos(5 \tan^4 x - 3 \sin^4 x) - \cos(5 \tan^4 x + 3 \sin^4 x)}{x^8}$$

$$718. \quad \lim_{n \rightarrow \infty} \int_0^n \frac{dx}{\left(1 + \frac{mx}{n}\right)^n \cdot \sqrt[n]{x+m}}$$

$$719. \quad \lim_{n \rightarrow \infty} \left(\sum_{k=1}^{2n+1} \frac{1}{2\sqrt{k}} - \prod_{k=1}^n \tan \frac{k\pi}{2n+1} \right)^{\frac{1}{2n+1}}$$

$$720. \quad \lim_{n \rightarrow \infty} \frac{e^{n^2} \cdot [(2n)!]^n}{n^{n^2} \cdot 2^{2n^2 + \frac{n}{2}} \cdot (n!)^n}$$

$$721. \quad \lim_{n \rightarrow \infty} \sum_{k=1}^n \frac{1}{k^k}$$

$$722. \quad \lim_{n \rightarrow \infty} \ln \left[\frac{n - 2na + 1}{n(1 - 2a)} \right]^n, \quad a \neq \frac{1}{2}$$

$$723. \quad \lim_{n \rightarrow \infty} n^2 \left(x^{\frac{1}{n}} - x^{\frac{1}{n+1}} \right), \quad x > 0$$

$$724. \quad \lim_{n \rightarrow \infty} \left[\log_{n-1} n \times \log_n (n+1) \times \cdots \times \log_{n^k-1} n^k \right]$$

$$725. \quad \lim_{x \rightarrow 0} \frac{\sqrt{x} + \sqrt[3]{x} + \sqrt[4]{x} + \sqrt[5]{x}}{\sqrt{x} - \sqrt[3]{x} - \sqrt[4]{x} - \sqrt[5]{x}}$$

$$726. \quad \lim_{n \rightarrow \infty} \sqrt[n]{2 \sin^2 \left(\frac{n^{1999}}{n+1} \right) + \cos^2 \left(\frac{n^{1999}}{n+1} \right)}$$

$$727. \quad \lim_{x \rightarrow \infty} \left(1 - \sin^2 x - \cos^2 x \right) e^{-\left(1 + \frac{1}{x} \right)^x}$$

$$728. \quad \lim_{x \rightarrow \infty} \left(\frac{x^2 + 3x - 1}{x^2 + 2x + 3} \right)^{\sin x}$$

$$729. \quad \lim_{x \rightarrow a} \left(\frac{a}{x} \right)^{\tan \left(\frac{\pi x}{2a} \right)}$$

$$730. \quad \lim_{x \rightarrow 0} \left(\frac{\text{Arctan } x}{x} \right)^{\frac{1}{x^2}}$$

$$731. \quad \lim_{n \rightarrow \infty} \left(\sqrt{1 + 4a^n} - 1 \right)^{\frac{1}{n}}, \quad 0 < a < 1$$

$$732. \quad \lim_{x \rightarrow a} \left(\tan x \cdot \cot a \right)^{\frac{1}{x-a}}$$

$$733. \quad \lim_{x \rightarrow \infty} \left[\sqrt{(x+a)(x+b)} - \sqrt{(x-a)(x-b)} \right]$$

$$734. \quad \lim_{x \rightarrow 0} \frac{x \tan 2x - 2x \tan x}{(1 - \cos 2x)^2}$$

$$735. \quad \lim_{n \rightarrow \infty} \left[\sqrt{1 + 2 + \dots + n} - \sqrt{1 + 2 + \dots + (n-1)} \right]$$

$$736. \quad \lim_{n \rightarrow \infty} \frac{(n+1)^p + (n+2)^p + \dots + (n+2n)^p}{1^p + 2^p + \dots + (2n)^p}, \quad p > 0$$

$$737. \quad \lim_{x \rightarrow \infty} x \left(2 - \frac{\pi}{\text{Arctan } x} \right)$$

$$738. \quad \lim_{n \rightarrow \infty} \sqrt{4 + \sqrt{4 + 3\sqrt{4 + 5\sqrt{4 + 7\sqrt{\cdots \sqrt{4 + (2n-1)\sqrt{4 + (2n+1)}}}}}}}$$

$$739. \quad \lim_{x \rightarrow 0} \frac{\sin(\pi \cos^2 x)}{x^2}$$

$$740. \quad \lim_{x \rightarrow 0} \frac{x(e^x + 1) - 2(e^x - 1)}{x^3}$$

$$741. \quad \lim_{x \rightarrow \frac{\pi}{2}} \frac{1 - (\sin x)^{\sin x}}{\cos^2 x}$$

$$742. \quad \lim_{x \rightarrow 1} (\cos 4\pi x)^{\frac{1}{\sin \pi x}}$$

$$743. \quad \lim_{n \rightarrow \infty} \frac{n + \sqrt{n} + \sqrt[3]{n} + \cdots + \sqrt[n]{n}}{n}$$

$$744. \quad \lim_{n \rightarrow +\infty} \sin^2 \left(\pi \sqrt{n^2 + n} \right)$$

$$745. \quad \lim_{n \rightarrow \infty} \sqrt[n]{1^2 + 2^2 + \cdots + n^2}$$

$$746. \quad \lim_{n \rightarrow \infty} \left(1 - \frac{2}{2 \times 3} \right) \left(1 - \frac{2}{3 \times 4} \right) \times \cdots \times \left[1 - \frac{2}{(n+1)(n+2)} \right]$$

$$747. \quad \lim_{n \rightarrow \infty} \sum_{k=1}^n \frac{x^{2^{k-1}}}{1 - x^{2^k}}, \quad x \neq 1, \quad x \neq -1$$

$$748. \quad \lim_{n \rightarrow \infty} \prod_{k=0}^n \left(1 + x^{2^k} \right), \quad x \in \mathbb{R}$$

$$749. \quad \lim_{n \rightarrow \infty} \prod_{k=0}^n \left(1 + \frac{2}{x^{2^k} + x^{-2^k}} \right), \quad x \in \mathbb{R}$$

$$750. \quad \lim_{n \rightarrow \infty} \prod_{k=1}^n \left(1 + x^{3^k} + x^{2 \cdot 3^k} \right), \quad x \in \mathbb{R}$$

$$751. \quad \lim_{n \rightarrow \infty} \prod_{k=2}^n \frac{k^3 - 1}{k^3 + 1}$$

$$752. \quad \lim_{n \rightarrow \infty} \frac{m(m-1) \times \cdots \times (m-n+1)}{n!} \cdot x^n, \quad m \in \mathbb{N}, \quad |x| < 1$$

$$753. \quad \lim_{n \rightarrow \infty} (n+1+n \cos n)^{\frac{1}{3n+n \sin n}}$$

$$754. \quad \lim_{x \rightarrow a} \frac{a^{2 \sin\left(\frac{\pi x}{2a}\right)} - \sqrt[3]{2a^6 - a^2 x^4}}{\ln\left(\frac{4x}{a} - 3\right)}$$

$$755. \quad \lim_{x \rightarrow \pi} \frac{1}{x - \pi} \cdot \left(2 - \sqrt{\frac{1 + 3 \cos^2 x}{2 + \cos x}} \right)$$

$$756. \quad \lim_{x \rightarrow \pi} \frac{x}{\pi - x} \cdot \cos\left(\frac{\pi x}{x + \pi}\right)$$

$$757. \quad \lim_{n \rightarrow +\infty} \sum_{k=1}^n \left[\frac{2019^k}{(673^k - 3^k)(673^{k+1} - 3^{k+1})} \right]$$

$$758. \quad \lim_{x \rightarrow 0} \left(\csc^3 x \cdot \cot x - 2 \cot^3 x \cdot \csc x + \frac{\cot^4 x}{\sec x} \right)$$

$$759. \quad \lim_{x \rightarrow \frac{\pi}{2}} \frac{\sin x - (\sin x)^{\sin x}}{1 - \sin x + \ln(\sin x)}$$

$$760. \quad \lim_{x \rightarrow a} \left[\sqrt{a^2 - x^2} \cdot \cot\left(\frac{\pi}{2} \cdot \sqrt{\frac{a-x}{a+x}}\right) \right]$$

$$761. \quad \lim_{x \rightarrow \frac{\pi}{4}} \frac{2\sqrt{2} - (\cos x + \sin x)^3}{1 - \sin 2x}$$

$$762. \quad \lim_{x \rightarrow 0} \frac{(2^m + x)^{\frac{1}{m}} - (2^n + x)^{\frac{1}{n}}}{x}$$

$$763. \quad \lim_{x \rightarrow 4} \frac{(\cos \alpha)^x - (\sin \alpha)^x - \cos 2\alpha}{x - 4}$$

$$764. \quad \lim_{x \rightarrow \infty} \left[\frac{(-1)^x}{x} \right]^{1 - \sin^2 x - \cos^2 x}$$

$$765. \quad \lim_{x \rightarrow 0} \frac{\cos x - (\cos x)^{\cos x}}{1 - \cos x + \ln(\cos x)}$$

$$766. \quad \lim_{x \rightarrow \frac{\pi}{4}} \frac{(\tan x)^{\tan x} - \tan x}{\ln(\tan x) - \tan x + 1}$$

$$767. \quad \lim_{x \rightarrow \infty} x \left[\operatorname{Arctan} \left(\frac{x+1}{x+2} \right) - \frac{\pi}{4} \right]$$

$$768. \quad \lim_{x \rightarrow 0} \frac{\cot x \cdot \operatorname{Arctan}(\alpha \tan x) - \alpha \cos^2 \left(\frac{x}{2} \right)}{\sin^2 \left(\frac{x}{2} \right)}$$

$$769. \quad \lim_{x \rightarrow +\infty} \frac{\frac{\pi}{2} - \operatorname{Arctan} x}{\frac{1}{2} \ln \left(\frac{x-1}{x+1} \right)}$$

$$770. \quad \lim_{x \rightarrow 0} \frac{x \cdot \sqrt[3]{\cos x} - \sin x}{x^5}$$

$$771. \quad \lim_{x \rightarrow 0} \frac{\sin(\sin x) - \sin x}{x^5}$$

$$772. \quad \lim_{x \rightarrow 0} \frac{\sqrt{\cos x} - \sqrt[4]{e^{-x^2}}}{x^4}$$

$$773. \quad \lim_{x \rightarrow 0} \frac{\ln(\cos x^2) + \sqrt[6]{1+3x^4} - 1}{x^8}$$

$$774. \quad \lim_{x \rightarrow 0} \frac{\cos 2x - e^{-2x^2 + \frac{4}{3}x^4}}{\tan(x^4)}$$

$$775. \quad \lim_{x \rightarrow 0} \frac{\cos 2x - e^{-2x^2 - \frac{4}{3}x^4}}{\tan(x^4)}$$

$$776. \quad \lim_{x \rightarrow 0} \frac{(1+x^2)^{\frac{1}{x}+5} - e^x}{\ln(\cos x)}$$

$$777. \quad \lim_{x \rightarrow 0} \frac{e^{\frac{x}{3}} - \sqrt{\frac{x+3}{3-x}}}{x^3}$$

$$778. \quad \lim_{x \rightarrow 0} \frac{\tan x - x \cdot \sqrt[3]{1+x^2}}{x^5}$$

$$779. \quad \lim_{x \rightarrow 0} \frac{18 \cdot \sqrt[3]{\sin(x^3)} - 18x + x^7}{x^{13}}$$

$$780. \quad \lim_{x \rightarrow 0} \frac{(\cos x)^{\sin x} - \sqrt{1-x^3}}{x^6}$$

$$781. \quad \lim_{x \rightarrow 0} \frac{\ln(\cos^2 x) + x^2 \cdot \sqrt[6]{1+x^2} - x^4}{x^6}$$

$$782. \quad \lim_{x \rightarrow 0} \frac{\cos(\sin x) - \sqrt{1-x^2} + x^4}{x^4}$$

$$783. \quad \lim_{x \rightarrow 0} \frac{\tan(\sin x) - shx}{\left(\sqrt[5]{\cos x} - 1\right)^2 \cdot \operatorname{Arctan} x^2}$$

$$784. \quad \lim_{x \rightarrow 0} \frac{e^{x^2} \cdot \cos x - chx - e^{-x^2} \cdot chx + \cos x}{x^6}$$

$$785. \quad \lim_{x \rightarrow 0} \frac{x^3 \cdot \sqrt{1+x} - \sin^3 x - \frac{x^3}{2} \cdot \tan x}{\ln(1+x^2) \cdot \left(\sqrt[3]{1+2x^3} - 1\right)}$$

$$786. \quad \lim_{x \rightarrow 0} \frac{\sqrt[3]{1+3\sin x} - e^{-x^2} - shx}{\operatorname{Arcsin} x^3}$$

$$787. \quad \lim_{x \rightarrow 0} \frac{e^x - \cos x \cdot \sqrt[3]{1+3x+6x^2}}{\operatorname{Arcsin} 2x \cdot \tan x \cdot sh3x}$$

$$788. \quad \lim_{x \rightarrow 0} \frac{(1+x)^{\frac{1}{x}} - e \cdot \left(\sqrt{1-x + \frac{x^2}{2}} + \sqrt[3]{1+x^2} - 1 \right)}{x^3}$$

$$789. \quad \lim_{x \rightarrow 0} \frac{\sin \left(x e^{\frac{x^2}{6}} \right) - x \cos x^2}{x^2 \cdot \ln(1+x^3)}$$

$$790. \quad \lim_{x \rightarrow 0} \frac{\ln \left(\frac{\sin x}{x} \right) + e^{\frac{x^2}{6}} - 1}{\ln(\cos x) + \sqrt{1+x^2} - 1}$$

$$791. \quad \lim_{x \rightarrow 0} \frac{e^{-\frac{x^2}{2}} - \sqrt[4]{\cos 2x} \cdot \cos x^3}{\ln^2(\cos 2x)}$$

$$792. \quad \lim_{x \rightarrow 0} \frac{e^{x^2} \cdot \cos x - \cos x}{x^5 + x^3 \sin^3 x}$$

$$793. \quad \lim_{x \rightarrow 0} \frac{e^{x^2} \cdot \cos x - \cos x + x^5}{x^6 + x^2 \sin^3 x}$$

$$794. \quad \lim_{x \rightarrow 0} \frac{1 - (\cos x)^{\sin x}}{x - \sin(x + x^3)}$$

$$795. \quad \lim_{x \rightarrow 0} \frac{\left[(1+x)^{\frac{1}{x}} - e \right]^2}{\ln(x + \cos x) - x}$$

$$796. \quad \lim_{x \rightarrow 0} \frac{\ln(\cos x) + e^{\frac{x^2}{2}} - 1}{\left(\sqrt[3]{1+3x} - \sqrt{1+2x} \right) \cdot \tan^2(\sin x)}$$

$$797. \quad \lim_{x \rightarrow 0} \frac{x\sqrt{1-x^2} - \cos x \cdot \ln(1+x) - \frac{x^2}{2}}{\tan x - \sin x}$$

$$798. \quad \lim_{x \rightarrow 0} \frac{\sin^2 x - x^2 e^{-x} - x^3}{1 - \sqrt{1+x^2} \cdot \cos x}$$

$$799. \quad \lim_{x \rightarrow 0} \frac{\sin(\sin x) - x + \frac{x^3}{3}}{\operatorname{sh}(shx) - \tan x}$$

$$800. \quad \lim_{x \rightarrow 0} \frac{\ln(1 - x + x^2 - x^3 + x^4) - \ln(1 - x + x^2) + x^3 \cos x - \frac{x^5}{2} \cdot \sqrt[3]{1 + 3x}}{x^7}$$

$$801. \quad \lim_{x \rightarrow \infty} \left[2x^4 \ln \left(1 - \frac{1}{x} \right) + \sqrt[3]{8x^9 + 12x^8 + 14x^7 + 15x^6 + 16x^5} \right]$$

$$802. \quad \lim_{x \rightarrow 0} \frac{\cos 2x - e^{-2x^2 - \frac{4}{3}x^4}}{\tan(3x^2) - 3thx^2}$$

$$803. \quad \lim_{x \rightarrow 0} \frac{\sqrt[4]{\cos 4x} - \cos(2xe^{x^2})}{(\sin 2x - 2 \tan x)^2}$$

$$804. \quad \lim_{x \rightarrow 0} \frac{8(\cos^8 x + \sin^8 x) - \sin^4 2x - 4 \cos 4x - 4}{\left(x - \frac{\pi}{4}\right)^2}$$

$$805. \quad \lim_{x \rightarrow 0} \cot^2 x \cdot \left(\sqrt{2 \cos^2 x + 3 \cos x + 4} - \sqrt{\cos^2 x + 7 \cos x + 1} \right)$$

$$806. \quad \lim_{x \rightarrow \frac{\pi}{2}} \tan^2 x \cdot \left(\sqrt{2 \sin^2 x + 3 \sin x + 4} - \sqrt{\sin^2 x + 6 \sin x + 2} \right)$$

$$807. \quad \lim_{n \rightarrow +\infty} \left(\frac{7}{10} + \frac{29}{10^2} + \frac{133}{10^3} + \dots + \frac{5^n + 2^n}{10^n} \right)$$

$$808. \quad \lim_{n \rightarrow \infty} \frac{2\pi}{3n} \sum_{k=1}^n \sec^2 \left(\frac{2k\pi}{3n} \right)$$

$$809. \quad \lim_{x \rightarrow \infty} \left[x \cos \left(\frac{1}{x} \right) - x^2 \sin \left(\frac{1}{x} \right) \right]$$

$$810. \quad \lim_{x \rightarrow 0} \frac{1 - \cos x \cdot \sin^2 x - \cos^2 x}{x^4}$$

$$811. \quad \lim_{n \rightarrow \infty} \frac{1}{n^2} \left[\sum_{k=1}^n \sqrt{k} \cdot \sum_{k=1}^n \frac{1}{\sqrt{k}} - \sum_{1 \leq i \leq j \leq n} \frac{(\sqrt{i} - \sqrt{j})^2}{\sqrt{i \cdot j}} \right]$$

$$812. \quad \lim_{n \rightarrow \infty} \left[\sum_{i=1}^n \sum_{j=1}^i \sum_{k=1}^j \sum_{l=1}^k \frac{1}{i \cdot j \cdot k \cdot l \cdot (i+1)(j+1)(k+1)(l+1)} \right]$$

$$813. \quad \lim_{n \rightarrow \infty} \frac{1}{n(n+1)} \sum_{k=1}^n \left[k \cdot \text{Arctan} \left(\frac{k^2 + k}{n^2 + n} \right) \right]$$

$$814. \quad \lim_{n \rightarrow \infty} \sqrt[n]{a_1 \times a_2 \times \dots \times a_n} \cdot \left(\frac{\sqrt[n+1]{a_1 \times a_2 \times \dots \times a_{n+1}}}{\sqrt[n]{a_1 \times a_2 \times \dots \times a_n}} - 1 \right)$$

$$815. \quad \lim_{n \rightarrow +\infty} \frac{1}{n^4} \left[\left(\sum_{k=1}^n k \right) + 2 \left(\sum_{k=1}^{n-1} k \right) + 3 \left(\sum_{k=1}^{n-2} k \right) + \dots + n \right]$$

$$816. \quad \lim_{n \rightarrow +\infty} \left(\left(\left(\left(\left(\left(\frac{e^{\frac{1}{n}} + e^{-\frac{1}{n}}}{2^{\frac{1}{n}} + 3^{\frac{1}{n}}} \right)^n \right)^{\frac{4}{3}} \right)^{\frac{10}{9}} \right)^{\frac{82}{81}} \dots \right)^{\frac{3^{2^n} + 1}{3^{2^n}}} \right)$$

$$817. \quad \lim_{x \rightarrow 0} \left(\lim_{y \rightarrow 0} \frac{x^2 - 2y}{x + y} \right)$$

$$818. \quad \lim_{m \rightarrow +\infty} \left[\lim_{n \rightarrow +\infty} \frac{1 + \sqrt[n]{1^n + 2^n} + \sqrt[n]{2^n + 3^n} + \dots + \sqrt[n]{(m-1)^n + m^n}}{m^2} \right]$$

$$819. \quad \lim_{n \rightarrow \infty} \left\{ C_n^3 \cdot \left[\lim_{m \rightarrow \infty} \frac{2(m+n+1)}{m} \cdot (\sin^2 x + \cos^2 x)^m \times \int_0^{\frac{\pi}{2}} \frac{\sin^7 x \cdot \cos^{2n} x}{\cos^5 x} dx \right] \right\}$$

$$820. \quad \lim_{y \rightarrow 0} \left(\lim_{x \rightarrow 0} \frac{x^2 + xy - 4}{x + y - 2} \right)$$

$$821. \quad \lim_{\alpha \rightarrow 0} \left(\lim_{\beta \rightarrow 0} \frac{\cos \alpha \cdot \sin \beta}{\alpha - \beta} \right)$$

$$822. \quad \lim_{\alpha \rightarrow 0} \left[\lim_{\beta \rightarrow \frac{\pi}{2}} \tan 2\beta \cdot \frac{\sin(\alpha + \beta)}{\cos(\alpha - \beta)} \right]$$

$$823. \quad \lim_{\substack{x \rightarrow 0 \\ y \rightarrow 0}} (x^2 + y^2) \cdot \sin \frac{1}{x y}$$

$$824. \quad \lim_{\substack{x \rightarrow 0 \\ y \rightarrow 2}} \frac{\sin(x y)}{x}$$

$$825. \quad \lim_{\substack{x \rightarrow 0 \\ y \rightarrow 0}} \frac{x}{x + y}$$

$$826. \quad \lim_{\substack{x \rightarrow \infty \\ y \rightarrow \infty}} \frac{x + y}{x^2 + y^2}$$

$$827. \quad \lim_{\substack{x \rightarrow \infty \\ y \rightarrow a}} \left(1 + \frac{y}{x} \right)^x$$

$$828. \quad \lim_{\substack{x \rightarrow 0 \\ y \rightarrow 0}} \frac{x^2 - y^2}{x^2 + y^2}$$

$$829. \quad \lim_{\substack{x \rightarrow 0 \\ y \rightarrow 0}} \frac{\cos(3x - 2y) - 1}{4y^2 - 12xy + 9x^2}$$

$$830. \quad \lim_{\substack{x \rightarrow 3 \\ y \rightarrow +\infty}} \left(\frac{y - 5x}{y + 3x - 2} \right)^{\frac{xy^3}{x^2 + y^2}}$$

$$831. \quad \lim_{\substack{x \rightarrow 0 \\ y \rightarrow 1}} \text{Arc tan} \left[\frac{x^2 + 1}{x^2 + (y - 1)^2} \right]$$

$$832. \quad \lim_{(x, y) \rightarrow (0, 0)} \frac{x - y}{x^2 + y^2}$$

$$833. \quad \lim_{(x, y) \rightarrow (0, 0)} \frac{3}{x^2 + 2y^2}$$

$$834. \quad \lim_{(x,y) \rightarrow (0,0)} \frac{\sin(x^2 + y^2)}{x^2 + y^2}$$

$$835. \quad \lim_{(x,y) \rightarrow (0,0)} \frac{1 - \cos(x^2 + y^2)}{x^2 + y^2}$$

$$836. \quad \lim_{(x,y) \rightarrow (0,0)} \frac{5xy^2 \cot(x+y)}{x^2 + 8y^4}$$

$$837. \quad \lim_{(x,y) \rightarrow (0,0)} \frac{x^4 - y^4}{x^2 + y^2}$$

$$838. \quad \lim_{(x,y) \rightarrow (4,-10)} \frac{y+10}{x^2y + 9y + 10x^2 + 90}$$

$$839. \quad \lim_{(x,y) \rightarrow (0,0)} \frac{x^4 - y^4}{x^4 + x^2y^2 + y^4}$$

$$840. \quad \lim_{(x,y) \rightarrow (0,0)} \frac{e^{-x^2-y^2} - 1}{x^2 + y^2}$$

$$841. \quad \lim_{(x,y) \rightarrow (0,0)} \frac{2x^2y - x^3}{x^2 + y^2}$$

$$842. \quad \lim_{(x,y) \rightarrow (0,0)} \frac{x^4 - 16y^4}{x^2 + 4y^2}$$

$$843. \quad \lim_{(x,y) \rightarrow (0,0)} \frac{xy}{3x^2 + 2y^2}$$

$$844. \quad \lim_{(x,y) \rightarrow (0,0)} \frac{1 - x^2 - y^2}{x^2 + y^2}$$

$$845. \quad \lim_{(x,y) \rightarrow (0,0)} e^{-\frac{1}{x^2+y^2}}$$

$$846. \quad \lim_{(x,y) \rightarrow (0,0)} \frac{e^{-\frac{1}{\sqrt{x^2+y^2}}}}{\sqrt{x^2 + y^2}}$$

$$847. \quad \lim_{(x,y) \rightarrow (0,0)} y \ln(x^2 + y^2)$$

$$848. \quad \lim_{(x,y) \rightarrow (0,0)} x \ln(|x| + |y|)$$

$$849. \quad \lim_{(x,y) \rightarrow (0,0)} \frac{x^2 y^2}{\sqrt{x^2 + y^2}}$$

$$850. \quad \lim_{(x,y) \rightarrow (0,0)} \frac{x^2 + y^2}{\sqrt{x^2 + y^2 + 1} - 1}$$

$$851. \quad \lim_{(x,y) \rightarrow (0,0)} \frac{x^4 y^4}{(x^2 + y^4)^2}$$

$$852. \quad \lim_{(x,y) \rightarrow (1,1)} \frac{x^2 - 2xy + y^2}{x - y}$$

$$853. \quad \lim_{(x,y) \rightarrow (1,1)} \frac{xy - y - 2x + 2}{x - 1}$$

$$854. \quad \lim_{(x,y) \rightarrow (0,0)} \frac{x^2 - y^2}{x - y}$$

$$855. \quad \lim_{(x,y) \rightarrow (0,0)} \frac{2 - \sqrt{xy + 4}}{xy}$$

$$856. \quad \lim_{(x,y) \rightarrow (0,0)} \frac{x + y}{x - y}$$

$$857. \quad \lim_{(x,y) \rightarrow (0,0)} \frac{x^4 + y^4}{(x^2 + y^2)^2}$$

$$858. \quad \lim_{(x,y) \rightarrow (6,2)} \frac{x^2 - 3xy}{x - 3y}$$

$$859. \quad \lim_{(x,y) \rightarrow (3,1)} \frac{x^2 - 7xy + 12y^2}{x - 3y}$$

$$860. \quad \lim_{(x,y) \rightarrow (2,2)} \frac{y^2 - 4}{xy - 2x}$$

$$861. \quad \lim_{(x,y) \rightarrow (1,-1)} \frac{\frac{1}{x} + \frac{1}{y}}{x + y}$$

$$862. \quad \lim_{(x,y) \rightarrow (-3,2)} \frac{x^2 y^2 - 36}{xy + 6}$$

$$863. \quad \lim_{(x,y) \rightarrow (0,0)} \frac{xy^3}{x^2 + y^6}$$

$$864. \quad \lim_{(x,y) \rightarrow (0,0)} \frac{x}{x^2 - y^2}$$

$$865. \quad \lim_{(x,y) \rightarrow (0,0)} \frac{x^3 - y^3}{x - y}$$

$$866. \quad \lim_{(x,y) \rightarrow (0,0)} \frac{x - y}{\sqrt{x} - \sqrt{y}}$$

$$867. \quad \lim_{(x,y) \rightarrow (0,0)} \frac{x^2 (1 - \cos xy)}{y^2}$$

$$868. \quad \lim_{(x,y) \rightarrow (0,0)} \frac{e^y \sin x}{x}$$

$$869. \quad \lim_{(x,y) \rightarrow (0,0)} \frac{y^2 \sin^2 x}{x^4 + y^4}$$

$$870. \quad \lim_{(x,y) \rightarrow (0,0)} \frac{xy^4}{x^2 + y^8}$$

$$871. \quad \lim_{(x,y) \rightarrow (0,0)} \frac{x^2 \sin^2 y}{x^2 + 2y^2}$$

$$872. \quad \lim_{(x,y) \rightarrow (0,0)} \frac{x^2 \cos^2 y}{x^2 + 2y^2}$$

$$873. \quad \lim_{(x,y) \rightarrow (0,0)} \frac{\sin x^2 + \sin y^2}{x - y}$$

$$874. \quad \lim_{(x,y) \rightarrow (1,1)} \frac{\sqrt{x+3y} - 2}{x+3y-4}$$

$$875. \quad \lim_{(x,y) \rightarrow (0,0)} \frac{x^5 - y^5}{x - y}$$

$$876. \lim_{(x,y) \rightarrow (0,0)} \frac{x^5 + y^5}{x - y}$$

$$877. \lim_{(x,y) \rightarrow (0,0)} \sqrt{x^2 + y^2} \cdot \ln(x^2 + y^2)$$

$$878. \lim_{(x,y) \rightarrow (0,1)} \frac{x^2 (y-1)^2}{x^2 + (y-1)^2}$$

$$879. \lim_{(x,y) \rightarrow (1,0)} \frac{x-1+y}{(x-1)^2 + y^2}$$

$$880. \lim_{(x,y) \rightarrow (1,0)} \frac{xy-y}{(x-1)^2 + y^2}$$

$$881. \lim_{(x,y) \rightarrow (1,1)} \frac{xy^2-1}{y-1}$$

$$882. \lim_{(x,y) \rightarrow (0,0)} \frac{x^3 - y^3}{x^2 + xy + y^2}$$

$$883. \lim_{(x,y) \rightarrow (0,0)} \frac{y^4}{x^4 + y^4}$$

$$884. \lim_{(x,y) \rightarrow (0,0)} \frac{|x|}{|x| + |y|}$$

$$885. \lim_{(x,y) \rightarrow (4,0)} (x^2 - 16) \cdot \cos \left[\frac{1}{(x-4)^2 + y^2} \right]$$

$$886. \lim_{(x,y) \rightarrow (4,0)} (x^2 + y^2) \cdot \sin \left(\frac{1}{x^2 + y^2} \right)$$

$$887. \lim_{(x,y,z) \rightarrow (2,-1,2)} \frac{xz^2}{\sqrt{x^2 + y^2 + z^2}}$$

$$888. \lim_{(x,y,z) \rightarrow (2,0,-1)} \ln(2x + y - z)$$

$$889. \lim_{(x,y,z) \rightarrow (0,0,0)} \frac{\sin(x^2 + y^2 + z^2)}{\sqrt{x^2 + y^2 + z^2}}$$

$$890. \lim_{(x,y,z) \rightarrow (0,0,0)} \frac{\sin \sqrt{x^2 + y^2 + z^2}}{x^2 + y^2 + z^2}$$

$$891. \lim_{(x,y,z) \rightarrow (0,0,0)} \frac{x^2 y^2 z^2}{x^2 + y^2 + z^2}$$

$$892. \lim_{(x,y,z) \rightarrow (0,0,0)} \frac{xyz}{x^2 + y^2 + z^2}$$

$$893. \text{ បង្ហាញថា } \lim_{x \rightarrow \infty} x \left(\frac{\sqrt{2\pi x}}{x!} \right)^{\frac{1}{x}} = e$$

$$894. \text{ បង្ហាញថា } \lim_{x \rightarrow \infty} \frac{x!}{x^x \cdot e^{-x} \cdot \sqrt{x}} = \sqrt{2\pi}$$

$$895. \text{ បើ } \lim_{x \rightarrow 0} \frac{\sin(\sin x) - \sin x}{ax^5 + bx^3 + c} = -\frac{1}{12} \text{ ។ រកតម្លៃនៃ } a \text{ ។ }$$

$$896. \text{ រកតម្លៃនៃ } a \text{ និង } b \text{ ដើម្បីឱ្យ } \lim_{x \rightarrow 0} \left(\frac{\tan 2x}{x^3} + \frac{a}{x^2} + \frac{\sin bx}{x} \right) = 0 \text{ ។ }$$

$$897. \text{ បើ } \lim_{a \rightarrow \infty} \frac{1}{a} \int_0^{\infty} \frac{x^2 + ax + 1}{1 + x^4} \cdot \text{Arctan} \frac{1}{x} dx = \frac{\pi^2}{k}, \quad k \in \mathbb{N}^* \text{ ។ រកតម្លៃនៃ } k \text{ ។ }$$

$$898. \text{ តាង } \alpha \text{ ជាឫសនៃសមីការដឺក្រេទី៣ } ax^3 + bx^2 + bx + a = 0 \text{ ។ គណនា } \lim_{x \rightarrow \frac{1}{\alpha}} \frac{\tan(ax^3 + bx^2 + bx + a)}{\alpha x - 1} \text{ ។ }$$

$$899. \text{ បើ } A = \int e^x \sin x dx \text{ និង } B = \int e^x \cos x dx \text{ ហើយ } \lim_{x \rightarrow -\infty} A = 0, \quad \lim_{x \rightarrow -\infty} B = 0 \text{ ។ គណនា } A^2 + B^2 \text{ ។ }$$

$$900. \text{ បើ } \lim_{x \rightarrow -2} \frac{3x^2 + \lambda x + 2}{x^2 + 3x + 2} = L \text{ ។ គណនា } \lambda + L \text{ ។ }$$

$$901. \text{ បើ } \lim_{x \rightarrow 0} \frac{[(a-n)nx - \tan x] \cdot \sin nx}{x^2} = 0, \quad n \in \mathbb{R}^* \text{ ។ រកតម្លៃនៃ } a \text{ ។ }$$

$$902. \text{ បើ } \lim_{x \rightarrow \infty} \left(\frac{x^2 + x + 1}{x + 1} - ax - b \right) = 4 \text{ ។ រកតម្លៃនៃ } a \text{ និង } b \text{ ។ }$$

$$903. \text{ គណនា } \lim_{n \rightarrow +\infty} \frac{1}{n^3} \left(\sum_{k=1}^n [k^2 x] \right) \text{ ដែល } [x] \text{ តាងឱ្យផ្នែកគត់ធំបំផុតដែលតូចជាងឬស្មើ } x \text{ ។ }$$

904. គណនា $\lim_{x \rightarrow 0} \frac{\tan(\lfloor -\pi^2 \rfloor \cdot x^2) - x^2 \tan(\lfloor -\pi^2 \rfloor)}{\sin^2 x}$ ដែល $\lfloor x \rfloor$ តាងឱ្យផ្នែកគត់ធំបំផុតដែលតូចជាងឬស្មើ x ។

905. គេឱ្យ $f(x) = x - \lfloor x \rfloor$ ។ គណនា $\lim_{n \rightarrow +\infty} \frac{\lfloor f(x) \rfloor^{2n} - 1}{\lfloor f(x) \rfloor^{2n} + 1}$ ។

906. បើ α និង β ជាឫសនៃសមីការដឺក្រេទី២ $ax^2 + bx + c = 0$ ។ គណនា $\lim_{x \rightarrow \alpha} (1 + ax^2 + bx + c)^{\frac{1}{x-\alpha}}$ ។

907. គណនា $\lim_{n \rightarrow +\infty} \frac{\{x\} + \{2x\} + \{3x\} + \dots + \{nx\}}{n^2}$ ដែល $\{x\} = x - \lfloor x \rfloor$ ផ្នែកទសភាគនៃ x ។

908. បើ $\Delta = \begin{vmatrix} \sin x & \sin(x+h) & \sin(x+2h) \\ \sin(x+2h) & \sin x & \sin(x+h) \\ \sin(x+h) & \sin(x+2h) & \sin x \end{vmatrix}$ ។ គណនា $\lim_{h \rightarrow 0} \frac{\Delta}{h^2}$ ។

909. បើ $\Delta_n = \begin{vmatrix} n! & (n+1)! & (n+2)! \\ (n+1)! & (n+2)! & (n+3)! \\ (n+2)! & (n+3)! & (n+4)! \end{vmatrix}$, $n \in \mathbb{N}$ ។ គណនា $\lim_{n \rightarrow +\infty} \frac{(3^{n^3} - 5) \cdot \Delta_n}{\Delta_{n+1}}$ ។

910. A, B, C ជាមុំនៃ $\triangle ABC$ ។ គេតាង $D_k = \begin{vmatrix} \sin A & \sin B & \sin C \\ \sin(A+kx) & \sin(B+kx) & \sin(C+kx) \\ \sin(A+kx) & \sin(B+kx) & \sin(C+kx) \end{vmatrix}$, $x \in \mathbb{R}$ ។

គណនា $\lim_{n \rightarrow \infty} \sum_{k=1}^n D_k$ ។

911. រកតម្លៃនៃ A, B, C និង D ដើម្បីឱ្យ $\lim_{x \rightarrow 0} \frac{\sin(Ax) + Bx + Cx^2 + Dx^3}{x^5} = \frac{4}{15}$ ។

912. រកតម្លៃនៃ a និង b ដើម្បីឱ្យ $\lim_{x \rightarrow 0} \left(\frac{\sin 2x}{x^3} + a + \frac{b}{x^2} \right) = 0$ ។

913. គេឱ្យអនុគមន៍ $f(x) = \cos x$ និង $g(x) = \sin x$ ។ គណនា $\lim_{h \rightarrow 0} \frac{f(x-2h) - f(x+h)}{g(x+3h) - g(x-h)}$ ។

914. គេឱ្យ f ជាអនុគមន៍មានដេរីវេត្រង់ x_0 ។ គណនា ៖

ក) $\lim_{h \rightarrow 0} \frac{f^2(x_0 + 3h) - f^2(x_0 + h)}{h}$

ខ) $\lim_{h \rightarrow 0} \frac{(x_0 + h) \cdot f(x_0) - x_0 \cdot f(x_0 + h)}{h}$

គ) $\lim_{h \rightarrow 0} \frac{h \cdot f(x_0 + h) + 2h \cdot f(x_0 + h) + 3h \cdot f(x_0 - h)}{h^2}$

915. កំណត់ពហុធានីក្រេទីង នៃអនុគមន៍ $f(x)$ ដែលផ្ទៀងផ្ទាត់ $\lim_{x \rightarrow +\infty} \frac{f(x)}{x^2 - 1} = 1$ និង $\lim_{x \rightarrow 1} \frac{f(x)}{x^2 - 1} = -1$ ។

916. គណនា $\lim_{n \rightarrow \infty} n \sum_{k=1}^n \frac{1}{\sqrt[4]{(2n-k)^3} \cdot (3n-k)^5}$

917. គណនា $\lim_{x \rightarrow 2} \left(\frac{\cos x}{\cos 2} \right)^{\frac{1}{x-2}}$

918. គណនា $\lim_{p \rightarrow \infty} \left[\lim_{n \rightarrow \infty} \sum_{k=1}^n \frac{k^{p-1}}{n^{p-1} \cdot \sqrt[p]{n^p + k^p}} \right], p \in \mathbb{N}, p \geq 1$

919. គណនា $\lim_{m \rightarrow \infty} \left(\cos \frac{x}{m} \right)^m$

920. គណនា $\lim_{n \rightarrow \infty} \sum_{k=0}^n \frac{C_k^n}{n^k \cdot (k+3)}$

921. គណនា $\lim_{n \rightarrow \infty} \left[\frac{1}{\sqrt{n}} e^{\sum_{k=1}^n \left(\frac{1}{2k-1} \right)} \int_0^{\frac{\pi}{2}} \left(\frac{\sin^2 x + \sin x}{\sin x + \cos x + 1} \right) dx + \frac{1}{\sqrt{n+1}} e^{\sum_{k=1}^{n+1} \left(\frac{1}{2k-1} \right)} \left(\frac{\cos^2 x + \cos x}{\cos x + \sin x + 1} \right) dx \right]$

$$922. \quad \text{គណនា} \quad \lim_{n \rightarrow \infty} n \left[\sum_{k=1}^n \left(\frac{1}{a^{n+k}} \cdot \frac{2}{b^{n+k}} \right) - n - \log 2 \cdot \log(ab^2) \right] , \quad a, b > 1$$

$$923. \quad \text{នៅក្នុង } \triangle ABC \text{ តាង } u = \cot A \cdot \cot B , \quad v = \cot B \cdot \cot C \text{ និង } w = \cot C \cdot \cot A$$

$$\text{ដែល } x_n, y_n, z_n > 0 , \quad n \in \mathbb{N} , \quad n \geq 1 \text{ ហើយ តាង } \lim_{n \rightarrow \infty} \frac{x_{n+1}}{nx_n} , \quad \lim_{n \rightarrow \infty} \frac{y_{n+1}}{ny_n} \text{ និង } \lim_{n \rightarrow \infty} \frac{z_{n+1}}{nz_n}$$

$$\text{ដែល } x, y, z > 0 \text{ ។ គណនា } \lim_{n \rightarrow \infty} \left(\sqrt[n+1]{x_{n+1}^u \cdot y_{n+1}^v \cdot z_{n+1}^w} - \sqrt[n]{x_n^u \cdot y_n^v \cdot z_n^w} \right) \text{ ។}$$

$$924. \quad \text{ថេរ } (a_n)_{n \geq 1} , (b_n)_{n \geq 1} \subset]0 , +\infty[$$

$$\text{ដែល } \lim_{n \rightarrow \infty} \left(\frac{a_{n+1}}{a_n} \cdot \frac{1}{n\sqrt{n}} \right) = a > 0 \text{ និង } \lim_{n \rightarrow \infty} \left(\frac{b_{n+1}}{b_n} \cdot \sqrt{n} \right) = b > 0 \text{ ។}$$

$$\text{គណនា } \lim_{n \rightarrow \infty} \sqrt[n]{a_n \cdot b_n} \left[\left(1 + \frac{1}{n} \right)^{n+1} - e \right] \text{ ។}$$

$$925. \quad \text{គណនា } \lim_{x \rightarrow 2} \frac{\sqrt{2x-3} \cdot \sqrt[3]{3x-5} \cdot \sqrt[4]{4x-7} \cdot \sqrt[5]{5x-9} - 1}{x-2}$$

$$926. \quad \text{គណនា } \lim_{x \rightarrow \infty} (\sin x) \frac{1}{x}$$

$$927. \quad \text{គណនា } \lim_{x \rightarrow \infty} (\cos x)^{\sin x}$$

$$928. \quad \text{គណនា } \lim_{x \rightarrow \infty} (\tan x)^{\cot x}$$

$$929. \quad \text{គណនា } \lim_{x \rightarrow \infty} \left(\frac{\sin x + \tan x}{\cos x + \cot x} \right)^{\sec x + \csc x}$$

$$930. \quad \text{គណនា } \lim_{x \rightarrow \infty} \left(\frac{e^x \ln x + \sin x}{e^x \ln x + \cos x} \right)^{\sin x}$$

$$931. \quad \text{គណនា} \quad \lim_{x \rightarrow 0} \frac{\ln(\sin x) + e^x \ln x - (\tan x)^{\sec x}}{\ln(\cos x) + e^x \ln x - (\cot x)^{\csc x}}$$

$$932. \quad \text{គណនា} \quad \lim_{x \rightarrow \infty} \frac{e^{\sin x} - \ln(\tan x)}{e^{\cos x} + \ln(\cot x)}$$

$$933. \quad \text{គណនា} \quad \lim_{x \rightarrow \infty} \left(\frac{\sin x}{\cos x} \right)^{\frac{\sec x + \csc x}{\tan x + \cot x}}$$

$$934. \quad \text{កំណត់តម្លៃនៃ } a, b, c \text{ និង } d \text{ ដែល } d \neq 0 \text{ ដើម្បីឱ្យ} \quad \lim_{x \rightarrow 0} \frac{e^x - (ax^2 + bx + c)}{x^3} = d \quad \forall$$

$$935. \quad \text{គណនា} \quad \lim_{n \rightarrow \infty} \left[\frac{1 + \frac{n(n+1)}{1+n^2} + \frac{n^2(n^2+1)}{1+n^4} + \dots + \frac{n^n(n^n+1)}{1+n^{2n}}}{n+1} \right]^{\frac{1}{n(n+1)}}, \quad n \in \mathbb{N}^*$$

$$936. \quad \text{គណនា} \quad \lim_{n \rightarrow \infty} \left\{ \lim_{x \rightarrow \frac{\pi}{2n+1}} \left[\frac{\cot x}{\cot\left(\frac{\pi}{2n+1}\right)} \right]^{\sum_{k=0}^{2n} \tan\left(x + \frac{k\pi}{2n+1}\right)} \right\}$$

$$937. \quad \text{គណនា} \quad \lim_{n \rightarrow \infty} \frac{\pi}{n} \cdot \left[\lim_{x \rightarrow \frac{\pi}{n}} \left(\frac{\tan x}{\tan \frac{\pi}{n}} \right)^{\tan\left(\frac{nx}{2}\right)} \right]$$

$$938. \quad \text{គណនា} \quad \lim_{n \rightarrow \infty} \left[\sqrt{\frac{1}{2}} \times \sqrt{\frac{1}{2} \left(1 + \sqrt{\frac{1}{2}} \right)} \times \cdots \times \underbrace{\sqrt{\frac{1}{2} \left(1 + \sqrt{\frac{1}{2} \left(1 + \cdots + \sqrt{\frac{1}{2}} \right)} \right)}}_{n \text{ times}} \right]$$

$$939. \quad \text{តាង } X, Y \in M_2(\mathbb{R}) \text{ ដែល } X^{19} + X^{17} = Y^{21} + Y^{19} = \begin{pmatrix} 1 & -1 \\ -1 & 1 \end{pmatrix} \text{ ។ គណនា } \lim_{n \rightarrow \infty} \sqrt[n]{\frac{\text{tr}(X^{n+1})}{\text{tr}(Y^{n+2})}}$$

$$940. \quad \text{កំណត់តម្លៃនៃ } a \text{ និង } b \text{ ដើម្បីឱ្យ } \lim_{x \rightarrow \pi} \frac{1}{(x - \pi)^2} \cdot \left(2 - \sqrt{\frac{a + b \cos^2 x}{2 + \cos x}} \right) = 1 \quad \text{។}$$

$$941. \quad \text{បើគេដឹងថា } \lim_{x \rightarrow 2} f(x) = 4 \text{ និង } \lim_{x \rightarrow 2} g(x) = -1 \quad \text{។}$$

$$\text{ចូរគណនា } \lim_{x \rightarrow 2} [2f(x) - 3g(x)] \text{ និង } \lim_{x \rightarrow 2} \left\{ [f(x)]^2 - 4[g(x)]^2 \right\} \quad \text{។}$$

$$942. \quad \text{បើគេដឹងថា } \lim_{x \rightarrow 1} [3f(x) - 2g(x)] = 5 \text{ និង } \lim_{x \rightarrow 1} [g(x) - 2f(x)] = -4 \quad \text{។}$$

$$\text{ចូរគណនា } \lim_{x \rightarrow 1} f(x) \text{ និង } \lim_{x \rightarrow 1} g(x) \quad \text{។}$$

$$943. \quad \text{គេឱ្យ } f(x) = \frac{x^3 - (a+4)x^2 + (4a+3)x - 3a}{x^2 - 4x + 3} \text{ ដែល } a \in \mathbb{R} \quad \text{។}$$

$$\text{ចូរគណនា } \lim_{x \rightarrow 1} f(x) \text{ និង } \lim_{x \rightarrow 3} f(x) \quad \text{។}$$

$$944. \quad \text{គេឱ្យពហុធា } P(x) = ax^2 + bx + c \text{ ដែល } a, b, c \in \mathbb{R} \quad \text{។}$$

$$\text{ចូរកំណត់រកចំនួនពិត } a, b, c \text{ ដោយដឹងថា } P(1) = 3 \text{ និង } \lim_{x \rightarrow 2} \frac{P(x)}{x-2} = -2 \quad \text{។}$$

945. គេឱ្យពហុធា $f(x) = ax^2 + bx + c$ ដែល $a \neq 0$, $a, b, c \in \mathbb{R}$ ។

$$\text{ចូរកំណត់តម្លៃនៃ } a, b, c \text{ ដោយដឹងថា } \left\{ \begin{array}{l} \lim_{x \rightarrow \infty} \frac{f(x) - x^2}{x^2 + 1} = 3 \\ \lim_{x \rightarrow \infty} \frac{f(x) - x(4x + 1)}{x + 1} = 4 \\ f(0) = 5 \end{array} \right. \quad \text{។}$$

946. គេឱ្យពហុធាដឺក្រេទី៣ $f(x) = ax^3 + bx^2 + cx + d$ ដែល $a \neq 0$, $a, b, c, d \in \mathbb{R}$ ។

$$\text{ចូរកំណត់តម្លៃនៃ } a, b, c, d \text{ ដោយដឹងថា } \left\{ \begin{array}{l} \lim_{x \rightarrow \infty} \frac{f(x) - x^3}{x^3 + 1} = 1 \\ \lim_{x \rightarrow \infty} \frac{f(x) - 2x^3 + x}{x^2 + 1} = 2 \\ \lim_{x \rightarrow 1} \frac{f(x)}{x - 1} = 3 \end{array} \right. \quad \text{។}$$

947. គេឱ្យពហុធា $f(x) = x^3 + ax^2 + bx + c$ ដែល $a, b, c \in \mathbb{R}$ ។

$$\text{ចូរកំណត់តម្លៃនៃ } a, b, c \text{ ដោយដឹងថា } \left\{ \begin{array}{l} \lim_{x \rightarrow \infty} \frac{f(x) - x^2(x + 1)}{x^2 - 1} = 1 \\ \lim_{x \rightarrow 1} \frac{f(x) - x^2(x + 1)}{x^2 - 1} = 2 \end{array} \right. \quad \text{។}$$

948. គេឱ្យពហុធា $f(x) = x^4 + ax^3 + bx^2 + cx + d$ ដែល $a, b, c, d \in \mathbb{R}$ ។

$$\text{ចូរកំណត់តម្លៃនៃ } a, b, c, d \text{ ដោយដឹងថា } \left\{ \begin{array}{l} \lim_{x \rightarrow \infty} \frac{f(x) - x^3}{x^2} = -6 \\ \lim_{x \rightarrow 1} \frac{f(x)}{(x - 1)^2} = -3 \end{array} \right. \quad \text{។}$$

$$949. \quad \text{គណនា} \quad \lim_{n \rightarrow \infty} \left\{ \lim_{x \rightarrow \frac{\pi}{4n+2}} \left[\frac{\tan x}{\tan \left(\frac{\pi}{4n+2} \right)} \right]^{\frac{1}{\left[\prod_{k=1}^n \cot^2 \left(\frac{k\pi}{2n+1} \right) \right] \cdot \left[\sum_{k=0}^{2n} \cot \left(x + \frac{k\pi}{2n+1} \right) \right]}} \right\}$$

950. គេមានស្វ៊ីត $(a_k)_{k \geq 1}$ ដែល $0 \leq a_k \leq 1$, $a_1 \neq 0$, $\alpha > 1$ ។

គេតាង $C_1 = a_1 + a_2 + \dots + a_n$ ។ បង្ហាញថា $\lim_{n \rightarrow \infty} \frac{C_1^\alpha + C_2^\alpha + \dots + C_n^\alpha}{(C_1 + C_2 + \dots + C_n)^\alpha} = 0$ ។

951. បើ $\lim_{x \rightarrow 0} \left[\frac{2}{x^3} \cdot (\text{Arcsin } x - \text{Arctan } x) \right] \frac{2}{x^3} = e^{-a}$ ។ គណនាតម្លៃនៃ $2a + 2013$ ។

952. បើ $\lim_{x \rightarrow 0} \frac{1 - \cos x + 2 \sin x - \sin^3 x - x^2 + 3x^4}{\tan^3 x - 6 \sin^2 x + x - 5x^3} = a$ ។ គណនាតម្លៃនៃ $a + 10$ ។

953. គណនា $\lim_{x \rightarrow \infty} C_n^x \cdot \left(\frac{m}{n} \right)^x \cdot \left(1 - \frac{m}{n} \right)^{n-x}$

954. គណនា $\lim_{n \rightarrow \infty} \left[\left(\frac{n}{n+1} \right) + \sin \left(\frac{1}{n} \right) \right]^n$

955. គណនា $\lim_{x \rightarrow \infty} \left[x + \sqrt{x^2 + x^2 \sin \left(\frac{1}{x} \right)} \right]$

956. គណនា $\lim_{x \rightarrow \infty} \left[\sqrt{(x^2 + a^2)(x^2 + b^2)} - \sqrt{(x^2 + c^2)(x^2 + d^2)} \right]$

957. គណនា $\lim_{x \rightarrow 0} \frac{32}{x^8} \cdot \left[1 - \cos \left(\frac{x^2}{2} \right) - \cos \left(\frac{x^4}{4} \right) + \cos \left(\frac{x^2}{2} \right) \cdot \cos \left(\frac{x^4}{4} \right) \right]$

958. គណនា $\lim_{x \rightarrow 0} \frac{\left(\int_0^{x+y} e^{t^2} dt \right)^2}{\int_0^{x+y} e^{2t^2} dt}$

$$959. \quad \text{គណនា} \quad \lim_{x \rightarrow 0^+} \left[\left(\sin x \right)^{\frac{1}{x}} + \left(\frac{1}{x} \right)^{\sin x} \right]^{\frac{1}{\ln \left[e^x - \ln(e+x) \right]}}$$

$$960. \quad \text{គណនា} \quad \lim_{x \rightarrow 1} \left[\tan \left(\frac{\pi}{4} + \ln x \right) \right]^{\frac{1}{\ln x}}$$

$$961. \quad \text{គណនា} \quad \lim_{x \rightarrow \infty} x \cdot \sin \left[\pi \cos \left(\frac{2\pi}{x-1} \right) \right]$$

$$962. \quad \text{គណនា} \quad \lim_{x \rightarrow 2} \frac{\sin \left[\pi \cos(\pi x) \right]}{(x-2)^2}$$

$$963. \quad \text{គណនា} \quad \lim_{x \rightarrow 0} \frac{\sin(\pi \cos^2 x)}{x^2}$$

$$964. \quad \text{គណនា} \quad \lim_{n \rightarrow +\infty} \left(3 \cdot \sqrt[n]{2} - 2 \cdot \sqrt[n]{3} \right)^n$$

$$965. \quad \text{បើ} \quad \lim_{x \rightarrow 0} \frac{729^x - 243^x - 81^x + 9^x + 3^x - 1}{x^3} = a \cdot (\log b)^c \quad \text{។ គណនាតម្លៃនៃ} \quad a^2 + b^3 + c^2 \quad \text{។}$$

$$966. \quad \text{បើ} \quad \lim_{x \rightarrow 1} \frac{(3+ax)^{\frac{5}{2}} - b \ln x + c \sin(x-1)}{(x-1)^2} = 2 \quad \text{។ គណនាតម្លៃនៃ} \quad a^2 + b^2 + c^2 \quad \text{។}$$

$$967. \quad \text{បើ} \quad \lim_{x \rightarrow 0} \frac{axe^x - b \log(1+x) + cxe^{-x}}{x^2 \sin x} = 2 \quad \text{។ គណនាតម្លៃនៃ} \quad \frac{a+b+c}{8} \quad \text{។}$$

$$968. \quad \text{បើ} \quad \lim_{n \rightarrow \infty} \frac{1^a + 2^a + \dots + n^a}{(n+1)^{a-1} \cdot \left[(na+1) + (na+2) + \dots + (na+n) \right]} = \frac{1}{60} \quad \text{ដែល} \quad n \neq -1, a \neq 0 \quad \text{។}$$

គណនាតម្លៃនៃ a ។

$$969. \quad \text{បើ } \lim_{x \rightarrow 0} \frac{1 + \sin x - \cos x + \log(1-x)}{x \tan^2 x} = -\frac{a}{b} \quad \text{។ គណនាតម្លៃនៃ } a+b \quad \text{។}$$

$$970. \quad \text{បើ } \lim_{x \rightarrow 0} \frac{e^x + e^{-x} + 2 \cos x - 4}{x^4} = \frac{a}{b}, \quad (a, b) \in \mathbb{N}^2 \quad \text{។ គណនាតម្លៃនៃ } b-a \quad \text{។}$$

$$971. \quad \text{បើ } \lim_{x \rightarrow 0} \frac{2x - \sin 2x - \operatorname{Arctan}\left(\frac{2x^3}{1+x^6}\right)}{x^3} = -\frac{a}{b}, \quad (a, b) \in \mathbb{N}^2 \quad \text{។ គណនាតម្លៃនៃ } a+b \quad \text{។}$$

$$972. \quad \text{បើ } \lim_{x \rightarrow \infty} x \cdot \left[\operatorname{Arctan}\left(\frac{x+2}{x+1}\right) - \operatorname{Arctan}\left(\frac{x}{x+2}\right) \right] = \frac{a}{b} \quad \text{។ គណនាតម្លៃនៃ } a+b \quad \text{។}$$

$$973. \quad \text{គេឱ្យ } f'(2) = 6, f'(1) = 4 \quad \text{។ គណនា } \lim_{h \rightarrow 0} \frac{f(2+h+h^2) - f(2)}{f(h-h^2+1) - f(1)} \quad \text{។}$$

$$974. \quad \text{រកតម្លៃដំបូងនៃចំនួនគត់មិនអវិជ្ជមាន } a \quad \text{ដែល } \lim_{x \rightarrow 1} \left[\frac{-ax + \sin(x-1) + a}{x + \sin(x-1) - 1} \right]^{\frac{1-x}{1-\sqrt{x}}} = \frac{1}{4} \quad \text{។}$$

$$975. \quad \text{តាង } f: \mathbb{R} \rightarrow \mathbb{R}, \quad f(1) = 3 \quad \text{និង } f'(1) = 6 \quad \text{។ គណនា } \lim_{x \rightarrow 0} \left[\frac{f(1+x)}{f(1)} \right]^{\frac{1}{x}} \quad \text{។}$$

$$976. \quad \text{គណនា } \lim_{x \rightarrow 2} \frac{(\cos \alpha)^x + (\sin \alpha)^x - 1}{x - 2}$$

$$977. \quad \text{គណនា } \lim_{x \rightarrow \frac{\pi}{2}} \frac{\left(1 - \tan \frac{x}{2}\right)(1 - \sin x)}{\left(1 + \tan \frac{x}{2}\right)(\pi - 2x)^3}$$

$$978. \quad \text{គណនា } \lim_{m \rightarrow \infty} \left\{ \lim_{n \rightarrow \infty} \left[1 + \cos^{2m}(\pi x \cdot n!) \right] \right\}$$

$$979. \quad \text{បើ } \lim_{x \rightarrow 0} \frac{(1+a^3)^{\frac{1}{x}} + 8e^{\frac{1}{x}}}{1 + (1-b^3)^{\frac{1}{x}} \cdot e^{\frac{1}{x}}} = 2 \quad \text{។ គណនាតម្លៃនៃ } a \text{ និង } b \text{ ។}$$

$$980. \quad \text{បើ } \lim_{x \rightarrow y} \frac{x^y - y^x}{x^x - y^y} = \frac{1-k}{1+k} \quad \text{។ គណនាតម្លៃនៃ } k \text{ ។}$$

$$981. \quad \text{គណនា } \lim_{n \rightarrow \infty} \sum_{k=1}^n \operatorname{Arccot} \left(\frac{k^3 - k + \frac{1}{k}}{2} \right)$$

$$982. \quad \text{គណនា } \lim_{x \rightarrow \frac{\pi}{2}} \sqrt{\frac{\tan x - \sin [\operatorname{Arctan}(\tan x)]}{\tan x + \cos^2(\tan x)}}$$

$$983. \quad \text{បើ } y = x + \frac{\sqrt{x}}{x + \frac{\sqrt{x}}{x + \frac{\sqrt{x}}{\dots \infty}}} \quad \text{។ គណនា } \lim_{x \rightarrow \infty} \frac{x}{y} \text{ ។}$$

$$984. \quad \text{បើ } \lim_{x \rightarrow 0} \left[1 + x + \frac{f(x)}{x} \right]^{\frac{1}{x}} = e^3 \quad \text{។ គណនា } \lim_{x \rightarrow 0} \left[1 + \frac{f(x)}{x} \right]^{\frac{1}{x}} \text{ ។}$$

$$985. \quad \text{គណនា } \lim_{x \rightarrow 1} \left(2 - \frac{1}{x} \right)^{\tan\left(\frac{\pi x}{2}\right)}$$

$$986. \quad \text{តាង } f : \mathbb{R} \rightarrow \mathbb{R} \text{ , } \lim_{x \rightarrow 0} \frac{f(x)}{x} = 1 \text{ ។ បើ } \lim_{x \rightarrow 0} \frac{x(1 + a \cos x) - b \sin x}{[f(x)]^3} = 1 \text{ ។}$$

គណនាតម្លៃនៃ $a + b + 10$ ។

$$987. \quad \text{គណនា } \lim_{x \rightarrow \pi^+} \frac{2^{\cot x} + 3^{\cot x} - 5^{1+\cot x} + 10}{\left(4^{\cot x}\right)^{\frac{1}{2}} + \left(27^{\cot x}\right)^{\frac{1}{3}} - 5^{\cot x} + 20}$$

988. តាង $f(x) = \cos 2x \cdot \cos 4x \cdot \cos 8x \cdot \cos 10x$ ហើយ $M = \lim_{x \rightarrow 0} \frac{1 - [f(x)]^3}{5 \tan^2 x}$ ។

គណនាតម្លៃនៃ $\sqrt{M-2} + 1$ ។

989. បើ $\lim_{x \rightarrow 0} \frac{\ln(1 + x + x^2 + \dots + x^n)}{nx} = \frac{1}{5}$ ។ គណនាតម្លៃនៃ n ។

990. បើ $\lim_{x \rightarrow 0} \frac{\tan x - \sin x}{x^3} = \frac{a}{b}$ ។ គណនាតម្លៃនៃ $a + b + 3$ ។

991. បើ $\lim_{x \rightarrow \infty} \frac{-\frac{1}{e^x} - 2\frac{1}{e^x}}{-\frac{1}{e^x} + b\frac{1}{e^x}} = 1$ ។ រកតម្លៃនៃ a និង b ។

992. គណនា $\lim_{x \rightarrow 0} \frac{a^{\tan x} - a^{\sin x}}{\tan x - \sin x}$, $a > 0$

993. បើ $\lim_{x \rightarrow 0} \frac{b \sin x - a \sin 2x}{e^{-x} \cdot \cos 2x \cdot x^3} = 1$ ។ រកតម្លៃនៃ a និង b ។

994. តាង $f : \mathbb{R} \rightarrow \mathbb{R}$, $f(a) = 1$, $f'(a) = 2$ ។ បើ $\lim_{x \rightarrow 0} \left[\frac{f^2(a+x)}{f(a)} \right]^{\frac{1}{x}} = e^k$ ។ រកតម្លៃនៃ k ។

995. គណនា $\lim_{x \rightarrow \frac{\pi}{4}} (\sin x - \cos x) \cdot \tan \left(x + \frac{\pi}{4} \right)$

996. គណនា $\lim_{x \rightarrow \frac{\pi}{2}} \frac{\tan^2 x + \tan x - 2}{\sin x - \cos x}$

997. គណនា $\lim_{n \rightarrow \infty} \left(1 + \frac{1}{n^2 + \cos n} \right)^{n^2 + n}$

998. គណនា $\lim_{x \rightarrow \frac{\pi}{2}} \frac{\cos x \cdot (1 - \sin x) \cdot (8x^3 - \pi^3)}{(\pi - 2x)^4}$

999. គណនា $\lim_{x \rightarrow 0} \frac{x^4 \cdot (\cot^4 x - \cot^2 x + 1)}{\tan^4 x - \tan^2 x + 1}$

1000. តាង $m = \lim_{x \rightarrow 1} \frac{(1-x)(1-x^2) \times \dots \times (1-x^{2n})}{\left[(1-x)(1-x^2) \times \dots \times (1-x^n) \right]^2}$ ។ គណនា ៖ $\lim_{n \rightarrow +\infty} \left(m \times \frac{n!}{n} \right)^{\frac{1}{n}}$ ។

1001. បង្ហាញថា $\lim_{n \rightarrow +\infty} \left(\frac{ma^{\frac{1}{n}} + qb^{\frac{1}{n}} + pc^{\frac{1}{n}}}{m+q+p} \right)^n = \left(a^m \cdot b^q \cdot c^p \right)^{\frac{1}{m+q+p}}, m+q+p \neq 0$ ។

1002. បង្ហាញថា $\lim_{n \rightarrow +\infty} \left(\frac{a^{\frac{1}{n}} + b^{\frac{1}{n}} + c^{\frac{1}{n}} + \dots + z^{\frac{1}{n}}}{26} \right)^n = (a \times b \times c \times \dots \times z)^{\frac{1}{26}}$ ។

1003. បើ $\lim_{x \rightarrow \infty} \left(1 + \frac{a}{x} + \frac{b}{x^2} \right)^{2x} = e^2$ ។ រកតម្លៃនៃ a និង b ។

1004. តាង f ជាអនុគមន៍មានដេរីវេត្រង់ $x=0$, $f'(0)=4$ ។ គណនា $\lim_{x \rightarrow 0} \frac{2f(x) - 3f(2x) + f(4x)}{x^2}$ ។

1005. បង្ហាញថាបើ $c > 0$ នោះ $\lim_{x \rightarrow c} \frac{x^c - c^x}{x^x - c^c} = \frac{1 - \ln c}{1 + \ln c}$ ។

1006. បើ $\lim_{x \rightarrow 0} \frac{\ln(a+x) - \ln a}{x} + k \cdot \lim_{x \rightarrow e} \frac{\ln x - 1}{x - e} = 1$ ។ រកតម្លៃនៃ k ។

1007. តាង $\alpha(a)$ និង $\beta(a)$ ជាឫសនៃសមីការ $(\sqrt[3]{1+a}-1)x^2 + (\sqrt{1+a}-1)x + (\sqrt[6]{1+a}-1) = 0$

ដែល $a > -1$ ។ គណនា $\lim_{a \rightarrow 0^+} \alpha(a)$ និង $\lim_{a \rightarrow 0^+} \beta(a)$ ។

1008. គណនា $\lim_{x \rightarrow a} \frac{a \sin x - x \sin a}{ax^2 - xa^2}$ ។

1009. តាង $f(x) = 3x^{10} - 7x^8 + 5x^6 - 21x^3 + 3x^2 - 7$ ។ គណនា $\lim_{h \rightarrow 0} \frac{f(1-h) - f(1)}{h^3 + 3h}$ ។

1010. បើ $\lim_{x \rightarrow 0} \left(\sin mx \cdot \cot \frac{x}{\sqrt{3}} \right) = 2$ ។ រកតម្លៃនៃ m ។

1011. បើ $\lim_{x \rightarrow 0} \left[1 + x \log \left(1 + b^2 \right) \right]^{\frac{1}{x}} = 2b \sin^2 \theta$ ដែល $b > 0$ ហើយ $\theta \in]-\pi, \pi]$ ។ រកតម្លៃនៃ θ ។

1012. គណនា $\lim_{x \rightarrow \frac{\pi}{4}} \frac{\int_2^{\sec^2 x} f(t) dt}{x^2 - \frac{\pi^2}{16}}$ ។

1013. គណនា $\lim_{n \rightarrow \infty} \left[n \cdot (-1)^n \right]$ ។

1014. គណនា $\lim_{n \rightarrow \infty} \cos \left[\frac{2^{2n+1} + (-2)^n}{5^n + 2^{2n-1}} \right]$ ។

1015. គណនា $\lim_{n \rightarrow \infty} \sin \left(\frac{n\pi}{2} \right)$ ។

1016. គណនា $\lim_{x \rightarrow 0} \frac{2 \sin^2 x + 2x - 2x \cos^2 x}{1 - \cos^2 2x}$ ។

1017. គណនា $\lim_{x \rightarrow 0} \frac{\tan x \cdot \text{Arctan } x - x^2}{x^6}$ ។

1018. គណនា $\lim_{x \rightarrow 0^+} \operatorname{Arctan} \left(\frac{x \sin x}{x - \sin x} \right)$ ។

1019. គណនា $\lim_{x \rightarrow 0} \frac{2 \sin x - \operatorname{Arctan} x - x}{2x^5}$ ។

1020. គណនា $\lim_{x \rightarrow 0} \frac{\sin(\tan x) - \sin(\sin x)}{\tan x - \sin x}$

1021. គណនា $\lim_{x \rightarrow 1} \frac{\sin(2 \ln x) - 2 \ln x}{\ln^3(x^4)}$

1022. គណនា $\lim_{x \rightarrow 0} \frac{\cos x \cdot \cos 2x \cdot \cos 4x \cdot \cos 8x - x \cot x}{x^2}$

1023. គណនា $\lim_{x \rightarrow \frac{\pi}{4}} \frac{\sqrt{2} - 2 \cos x}{\sqrt{2} - 2 \sin x}$

1024. គណនា $\lim_{x \rightarrow 0} \frac{(x+1)^8 - (x-1)^8}{(x+1)^5 + (x-1)^5}$

1025. គណនា $\lim_{n \rightarrow \infty} \frac{3^{3n} \cdot (n!)^3}{(3n+1)!}$

1026. គណនា $\lim_{x \rightarrow 0} \frac{\tan \left(\frac{\pi^2}{4\pi + x} \right) - 1}{x}$

1027. គណនា $\lim_{x \rightarrow 2} \frac{\log_2 x - \log_x 2}{\log x - \log 2}$

1028. គណនា $\lim_{x \rightarrow 0} \frac{\left[x - 3 \tan \left(\frac{\pi}{x+4} \right) + 3 \right] \cdot (e^{\cos x} - e)}{\cos(5 \operatorname{Arccos} x) - 5x}$

$$1029. \text{ គណនា } \lim_{x \rightarrow 0} \frac{e^{e^x} - e}{e^{3x} - \sec x}$$

$$1030. \text{ គណនា } \lim_{x \rightarrow \frac{\pi}{2}} \left(\frac{\sec^2 x + \tan^2 x - 2}{\sec^2 x + \tan^2 x - \sec x + 2} \right)^{\frac{\tan^2 x}{\sec x}}$$

$$1031. \text{ គណនា } \lim_{x \rightarrow 0} \frac{4.81^x - 27^x - 9^x - 3^x - 1}{1 - \sqrt[3]{1 + x + x^2}}$$

$$1032. \text{ គណនា } \lim_{x \rightarrow 0} \frac{\cos x - \left(\frac{1 - \frac{5}{12}x^2}{1 + \frac{1}{12}x^2} \right)}{x^6}$$

$$1033. \text{ គណនា } \lim_{x \rightarrow a} \frac{\sqrt{2a^3x - x^4} - a \cdot \sqrt[3]{a^2x}}{a - \sqrt[4]{ax^3}}$$

$$1034. \text{ គណនា } \lim_{x \rightarrow \infty} \left[1 + \sin \left(\pi \cdot \sqrt{4x^2 + 1} \right) \right]^x$$

$$1035. \text{ គណនា } \lim_{x \rightarrow 1} \left\{ \sin \left[\frac{\pi}{2} \left(x^2 - 4x + 4 \right) \right] \right\}^{\frac{x}{(x-1)^2}}$$

$$1036. \text{ គណនា } \lim_{x \rightarrow 0} \left(e^x + e^{-x} + 1 \right)^{\frac{1}{x^2}}$$

$$1037. \text{ គណនា } \lim_{x \rightarrow 0} \left(\frac{x^2 + x + 1}{x^2 - x + 1} \right)^{-\csc x}$$

$$1038. \text{ គណនា } \lim_{x \rightarrow 1} \frac{\ln \left[\tan \left(\pi \sec \pi x \right) + 1 \right]}{e^{x-1} - x}$$

$$1039. \text{ គណនា } \lim_{x \rightarrow 0} \frac{\tan^2 x + 2 \ln(\cos x)}{\sin^2 x - \ln(1 + \sin^2 x)}$$

$$1040. \text{ គណនា } \lim_{x \rightarrow \frac{\pi}{2}} \left(\frac{2 \sec^2 x - 3}{2 \sec^2 x - \sec x + 1} \right)^{\frac{\sin^2 x}{\cos x}}$$

$$1041. \text{ គណនា } \lim_{n \rightarrow \infty} n \cdot \operatorname{Arctan} \left[\frac{1}{(x^2 + 1)^{n+1}} \right] \cdot \left[\tan \left(\frac{\pi}{4} + \frac{x}{2n} \right) \right]^n$$

$$1042. \text{ គណនា } \lim_{x \rightarrow \infty} \left(\frac{x^2 + 1}{x^2 - 1} \right)^{(x^4 - 1) \cdot \sin^2 \left(\frac{1}{x} \right)}$$

$$1043. \text{ គណនា } \lim_{x \rightarrow 0} \left[\ln(x^2 + e) \right]^{\frac{1}{\cos x - 1}}$$

$$1044. \text{ គណនា } \lim_{x \rightarrow 0} \frac{(1 - \cos x) \cdot \sqrt{1 + \cos x} - 2\sqrt{2} \cdot \sin^2 \left(\frac{x}{2} \right)}{x^4}$$

$$1045. \text{ គណនា } \lim_{x \rightarrow +\infty} \left[\sin \left(\frac{\pi x + 4}{2x + 3} \right) \right]^{\frac{x^2}{1 + 2x}}$$

$$1046. \text{ គណនា } \lim_{x \rightarrow 1} (2 + \cos \pi x)^{\frac{1}{x^3 - 3x + 2}}$$

$$1047. \text{ គណនា } \lim_{x \rightarrow \frac{\pi}{3}} \frac{\tan^3 x - 3 \tan x}{\cos \left(x + \frac{\pi}{6} \right)}$$

$$1048. \text{ គណនា } \lim_{x \rightarrow 0} \frac{5x - \cos(5 \operatorname{Arccos} x)}{5x + \sin(5 \operatorname{Arcsin} x)}$$

$$1049. \text{ គណនា } \lim_{n \rightarrow \infty} n \sqrt[n]{\frac{(3n)!}{(2n)! \times n^n}}$$

$$1050. \text{ គណនា } \lim_{x \rightarrow 1} \frac{\sin \left[\pi - \cos^4 \left(\frac{\pi x}{2} \right) \right]}{e^{1 - \sin \left(\frac{\pi x}{2} \right)} + e^{\sin \left(\frac{\pi x}{2} \right) - 1} - 2}$$

$$1051. \text{ គណនា } \lim_{x \rightarrow 1} (x-1-\ln x) \sqrt{\sin \left(\frac{\pi x}{2} \right)}$$

$$1052. \text{ គណនា } \lim_{x \rightarrow 0} \frac{\sin x - 2 \sin \left(\frac{x}{2} \right) + 8 \sin^3 \left(\frac{x}{4} \right)}{x^5}$$

$$1053. \text{ គណនា } \lim_{x \rightarrow 0^+} \frac{(\sec x)^{\sec x} - (\cos x)^{\cos x}}{x^2}$$

$$1054. \text{ គណនា } \lim_{x \rightarrow \infty} \left(\sqrt[3]{8^x + 3^x} - \sqrt{4^x - 2^x} \right)$$

$$1055. \text{ គណនា } \lim_{x \rightarrow 0} \frac{x(1 - \cos x)}{x^2 + x - e^x \cdot \sin x}$$

$$1056. \text{ គណនា } \lim_{x \rightarrow 0} x^2 \sqrt{1 + \sin \left(1 - \frac{\sin x}{x} \right)}$$

$$1057. \text{ គណនា } \lim_{x \rightarrow 0} x \sqrt{1 + \sin \left(1 - \frac{e^x - 1}{x} \right)}$$

$$1058. \text{ គណនា } \lim_{x \rightarrow 1} \frac{3 \sin(\pi x) - \sin(3\pi x)}{(x-1)^3}$$

$$1059. \text{ គណនា } \lim_{x \rightarrow 0} \frac{\cos 6x + \cos 4x + \cos 2x - 3 + 28x^2}{x^4}$$

1060. គណនា $\lim_{x \rightarrow 0} \frac{\sin^2 x - \sin^2 2x + 3x^2}{x^4}$

1061. គណនា $\lim_{x \rightarrow 0} \frac{\frac{x}{\sin x} - 2 + \frac{\sin x}{x}}{x^4}$

1062. គណនា $\lim_{x \rightarrow 0} \frac{\ln \left(\frac{3 - \cos 2x - 2x^2}{2} \right)}{x^4}$

1063. គណនា $\lim_{x \rightarrow \frac{\pi}{4}} \frac{\sqrt{2} - \cos x - \sin x}{(4x - \pi)^2}$

1064. គណនា $\lim_{x \rightarrow 0} \frac{64^x + 3.48^x + 3.36^x - 27^x}{x^3}$

1065. គណនា $\lim_{x \rightarrow e} \frac{x - e \ln x}{(x - e)^2}$

1066. គណនា $\lim_{x \rightarrow \frac{\pi}{4}} \frac{4\sqrt{2} - (\cos x + \sin x)^5}{1 - \sin 2x}$

1067. គណនា $\lim_{n \rightarrow \infty} \left(\sqrt[3]{8^n + 4^n + 2^n} - 2^n \right)$

1068. បង្ហាញថា $\lim_{n \rightarrow \infty} \left[\frac{1}{\sqrt{3} \cdot (\sqrt{3} - \sqrt{2})} - \sqrt{\frac{n + \sqrt{n^2 + 1}}{3n + 1}} \right]^{\sqrt{n}} = 1$

1069. គណនា $\lim_{x \rightarrow \cos\left(\frac{\pi}{18}\right) + \cos\left(\frac{11\pi}{18}\right) + \cos\left(\frac{13\pi}{18}\right)} \frac{\cos(\cos x) - \sin(\sin x) - \cos[\log(\cos x)]}{\tan(\tan x)}$

1070. គណនា $\lim_{x \rightarrow 4} \frac{\frac{\pi}{6} - \operatorname{Arcsin}\left(\frac{\sqrt{x}}{4}\right)}{\sqrt[3]{2x-7} - 1}$

1071. គណនា $\lim_{x \rightarrow 0} \sqrt{x \cdot \left(-2 + \sin \frac{1}{x}\right) + 4 \cos x}$

1072. គណនា $\lim_{n \rightarrow \infty} \left[\frac{\ln(n+1) + \ln(n+2) + \dots + \ln(n+n)}{n} - \ln n \right]$

1073. តាង $f(x, y) = \frac{x^3 - y}{x^3 + y}$ ។ គណនា $\lim_{x \rightarrow 0} \lim_{y \rightarrow 0} f(x, y)$ និង $\lim_{y \rightarrow 0} \lim_{x \rightarrow 0} f(x, y)$ ។

1074. គណនា $\lim_{x \rightarrow 0} \frac{e^x - 1}{\pi^x - 1}$

1075. គណនា $\lim_{x \rightarrow 0} \left[\frac{1 - \cos 2x}{4 - 4 \sin(2x)} \cdot \left(x^{-2x} + x^{1-2x} \right)^{\frac{1}{x}} \right]$

1076. គណនា $\lim_{n \rightarrow \infty} \int_0^{+\infty} \sqrt{1 + \cos(2nx)} \, dx$

1077. គណនា $\lim_{n \rightarrow \infty} \sin^2 \left(\pi \cdot \sqrt{n^2 + n} \right)$

1078. គណនា $\lim_{n \rightarrow \infty} \frac{\left(1 + \frac{1}{n}\right)^{n^2}}{e^n}$

1079. តាង $A = \begin{bmatrix} 1 & \frac{x}{n} \\ -\frac{x}{n} & 1 \end{bmatrix}$, $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ ។ គណនា $\lim_{x \rightarrow 0} \left[\lim_{n \rightarrow \infty} \frac{1}{x} \cdot \det(A^n - I) \right]$ ។

1080. គណនា $\lim_{n \rightarrow \infty} n \cdot \left[1 - \frac{1}{e} \cdot \left(1 + \frac{1}{n}\right)^n \right]$

1081. គណនា $\lim_{n \rightarrow \infty} \frac{\log(n^2 + \sin n)}{\log(n + \cos n)}$

1082. តាង $f(x) = \frac{e^{2010x} - 2}{e^{2011x} + 1}$ ។ គណនា $L = \left[\lim_{x \rightarrow -\infty} f(x) + \lim_{x \rightarrow +\infty} f(x) \right] \cdot \lim_{x \rightarrow 0} f(x)$

1083. គណនា $\lim_{x \rightarrow \infty} \left[\tan\left(\frac{\pi x}{2x+1}\right) \right]^{\frac{1}{x}}$

1084. គណនា $\lim_{x \rightarrow 2} \frac{1 + \cos\left(\frac{\pi x}{2}\right)}{\ln 8 - \ln\left[\frac{8}{x} + e^{\ln(2x)}\right]}$

1085. គណនា $\lim_{x \rightarrow 3} \left[\sin\left(\frac{x-3}{2}\right) \cdot \tan\left(\frac{\pi x}{6}\right) \right]$

1086. គណនា $\lim_{n \rightarrow 0} \int_0^{\frac{\pi}{4}} \operatorname{Arccot}(nx) \cdot \frac{\sin x + \cos x}{9 + 16 \sin x \cdot \cos x} dx$

1087. គណនា $\lim_{n \rightarrow \infty} \sin\left[\left(2n\pi + \frac{1}{2n\pi}\right) \cdot \sin\left(2n\pi + \frac{1}{2n\pi}\right)\right]$

1088. រកតម្លៃនៃ x ដើម្បីឱ្យ $\lim_{n \rightarrow \infty} \left[(1+x)(1+x^2)(1+x^4) \times \dots \times (1+x^{2^n}) \right] = 2010$ ។

1089. គណនា $\lim_{x \rightarrow \infty} \frac{(ax+1)^n}{x^n + b}$, $n \in \mathbb{Z}$

1090. គណនា $\lim_{n \rightarrow \infty} \frac{(2n-1)!!}{n^2 \cdot (2n-5)!! - (2n-3)!!}$

1091. បើ $\lim_{x \rightarrow 1} \frac{f(x)}{1-x^3} = 4$ និង $\lim_{x \rightarrow 1} \frac{g(x)}{1-x^2} = -6$ ។ គណនា $\lim_{x \rightarrow 1} \frac{f(x)}{g(x)}$

1092. គណនា $\lim_{x \rightarrow a} \left[\operatorname{Arcsin} \left(\frac{x-a}{a} \right) \cdot \cot(x-a) \right]$

1093. បង្ហាញថា $2 \cos x + 1 = 4 \cos^2 \left(\frac{x}{2} \right) - 1$ ។

រួចគណនា $\lim_{x \rightarrow \infty} \left[\left(2 \cos \frac{x}{2} - 1 \right) \left(2 \cos \frac{x}{2^2} - 1 \right) \times \cdots \times \left(2 \cos \frac{x}{2^n} - 1 \right) \right]$

1094. គណនា $\lim_{x \rightarrow 0} \frac{\ln \left(nx + \sqrt{1 - n^2 x^2} \right)}{\ln \left(x + \sqrt{1 - x^2} \right)}$

1095. គណនា $\lim_{x \rightarrow 0} \left(\frac{a^{x^2} + b^{x^2}}{a^x + b^x} \right)^{\frac{1}{x}}, (a > 0, b > 0)$

1096. គណនា $\lim_{n \rightarrow \infty} \left(\frac{\frac{1}{2^n}}{n+1} + \frac{\frac{2}{2^n}}{n+\frac{1}{2}} + \cdots + \frac{\frac{n}{2^n}}{n+\frac{1}{n}} \right)$

1097. គណនា $\lim_{x \rightarrow 0} \frac{x(e^x - e^{-x})}{e^{x^3+1} - e}$

1098. គណនា $\lim_{x \rightarrow 0} \left(2 - \cos x - \sin^2 x \right)^{\frac{1}{x^2}}$

1099. គណនា $\lim_{x \rightarrow \infty} \left[\frac{(2x)!}{(x!)^2} \right]^{\frac{1}{x}}$

1100. គណនា $\lim_{x \rightarrow \pm \infty} \sum_{n=0}^{+\infty} \left[\frac{(2n)!! \times x^{2n+1}}{(2n+1)!! \times (1+x^2)^{n+1}} \right]$

1101. គណនា $\lim_{x \rightarrow 1} \sum_{n=0}^{+\infty} \left[\frac{(2n)!! \times x^{2n+1}}{(2n+1)!! \times (1+x^2)^{n+1}} \right]$

1102. បង្ហាញថា $\lim_{n \rightarrow \infty} \left[n \cdot \left(\sqrt{\frac{2}{3}} - \sqrt{\frac{n + \sqrt{n^2 + 1}}{3n + 1}} \right) \right] = \frac{1}{3\sqrt{6}}$

1103. តាង $L = \lim_{n \rightarrow \infty} \int_0^1 \frac{nx^{n-1}}{1+x} dx$ និង $M = \lim_{n \rightarrow \infty} n \cdot \left[\int_0^1 nx^{n-1} \cdot \left(\frac{1}{1+x} - L \right) dx \right]$ ។

គណនា $N = \lim_{n \rightarrow \infty} n^2 \cdot \left\{ \int_0^1 nx^{n-1} \cdot \left[n \cdot \left(\frac{1}{1+x} - L \right) - M \right] dx \right\}$

1104. តាង $A = \begin{bmatrix} 1 & 2 & 3 \\ 0 & 0 & 0 \\ 3 & 2 & 1 \end{bmatrix}$, $A^n = \begin{bmatrix} a_n & b_n & c_n \\ 0 & 0 & 0 \\ c_n & b_n & a_n \end{bmatrix}$ ដែល $n \in \mathbb{N}^*$ ។

គណនា $\lim_{n \rightarrow \infty} \left[\frac{2}{\pi} \operatorname{Arccos} \left(\frac{1}{2a_n + 2b_n + 2c_n} \right) \right]^{4^n}$

1105. បើ $a \in]-1, 1[$ ។ បង្ហាញថា $\lim_{n \rightarrow \infty} \sum_{k=1}^n \left[\frac{(-1)^k \cdot \cos(k \operatorname{Arccos} a)}{k} \right] \leq \log \left(\sqrt{2e^a} \right)$

1106. គណនា $\lim_{n \rightarrow \infty} \frac{1}{n} \cdot \left[\frac{1}{e^{1+n^2}} + \frac{2}{e^{2+(n-1)^2}} + \frac{3}{e^{3+(n-2)^2}} + \dots + \frac{n}{e^{n+1}} \right]$

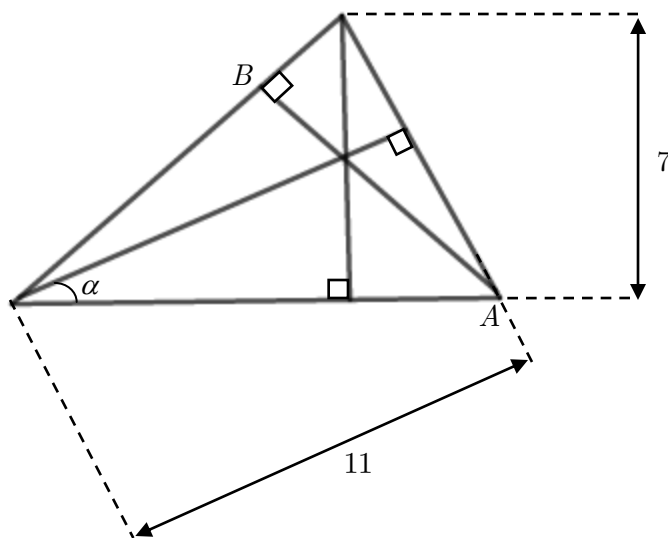
1107. គណនា $\lim_{x \rightarrow 2} \left(\sqrt[6]{\frac{6x^4 - 12x^3 - x + 2}{x - 2}} \times \frac{\sqrt[3]{x^3 - \sqrt{x^2 + 60}}}{\sqrt{x^2 - \sqrt[3]{x^2 + 60}}} \right)$

1108. បង្ហាញថា ៖

ក. $\lim_{\alpha \rightarrow \infty} \int_{-\infty}^{+\infty} e^{-\alpha x^2} dx = 0$

ខ. $\lim_{\alpha \rightarrow \infty} \sum_{n=-\infty}^{+\infty} e^{-\alpha x^2} = 1$

1109. គេឱ្យរូបដូចខាងក្រោម ៖



ចូរគណនា $\lim_{\alpha \rightarrow \frac{\pi}{2}} AB$ ។

1110. បើ f ជាអនុគមន៍រំដួលមានដែល $f(x+T) = f(x)$, $(T > 0)$, $\forall x \in \mathbb{R}$ ។

គណនា $\lim_{n \rightarrow \infty} \left[\frac{n \cdot \frac{f(x+T) + 2f(x+2T) + \dots + nf(x+nT)}{f(x+T) + 4f(x+4T) + \dots + n^2 f(x+n^2T)}}{f(x+T) + 4f(x+4T) + \dots + n^2 f(x+n^2T)} \right]$ ។

1111. តាង f ជាអនុគមន៍មានដេរីវេត្រង់ $x = a$, $\alpha, \beta \in \mathbb{R}$ ។ គណនា ៖

ក. $\lim_{h \rightarrow 0} \frac{\beta f(a + \alpha h) - \alpha f(a + \beta h) + (\alpha - \beta)f(a)}{h^2}$

ខ. $\lim_{h \rightarrow 0} \frac{f(a + \alpha h) + f(a + \beta h) - 2f(a)}{h^2}$, $f'(a) = 0$

ជូនពរឱ្យសំណាងល្អ និង ទទួលបានជោគជ័យគ្រប់ការកិច្ច

ឯកសារយោង

- សៀវភៅ លីមីតនៃអនុគមន៍ (សាស្ត្រាចារ្យ ទិត្យ ម៉ែង)
- សៀវភៅ វិញ្ញាសា និង លំហាត់គណិតវិទ្យា (លោកគ្រូ ហៃ ប៉ាហ៊ុន)
- សៀវភៅ គណិតវិភាគ (សាស្ត្រាចារ្យគណិតវិទ្យាថ្នាក់ទ្រាំសិក្សាមូលដ្ឋាន : វិទ្យាស្ថានបច្ចេកវិទ្យាកម្ពុជា)
- សៀវភៅ លីមីតនៃអនុគមន៍ ២០០ លំហាត់ (ក្វយកូមេត និង គង់នីតា : Friends Book)
- សៀវភៅ កម្រងលំហាត់គណិតវិទ្យាសម្រាប់សិស្សពូកែ ភាគ១ (លោកគ្រូ ចាន់ សំអាត)
- សៀវភៅ កម្រងលំហាត់គណិតវិទ្យាកម្រិតវិទ្យាល័យ លីមីតនៃអនុគមន៍ (លោកគ្រូ លឹម ផល្គុន)
- លំហាត់លីមីត (លោកគ្រូ សួន ច័ន្ទសុធី)
- A COMPLETE RESOURCE BOOK IN MATHEMATICS FOR JEE MAIN 2017 (DINESH KHATTAR)
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