



MATHS

BOOKS - RD SHARMA MATHS (HINGLISH)

LIMITS

Others

1. Evaluate the following limit: $\lim_{x \rightarrow 1} \frac{x^2 + 1}{x + 1}$



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2. Evaluate the following limit: $\lim_{x \rightarrow 1} \frac{\sqrt{x+8}}{\sqrt{x}}$



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3. Evaluate the following limit:

$$\lim_{x \rightarrow -1} (4x^2 + 2)$$



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4. Evaluate the following limit: $\lim_{x \rightarrow 3} \frac{x^2 - 2}{x + 2}$



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5. Evaluate the following limit:

$$\lim_{x \rightarrow 0} \frac{2x^2 + 3x + 4}{x^2 + 3x + 2}$$



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6. Evaluate the following limit: $\lim_{x \rightarrow a} \frac{\sqrt{x} + \sqrt{a}}{x + a}$



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7. Evaluate the following limit: $\lim_{x \rightarrow 0} 9$



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8. Evaluate the following limit:

$$\lim_{x \rightarrow -1} \frac{x^3 - 3x + 1}{x - 1}$$



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9. Evaluate the following limit:

$$\lim_{x \rightarrow 0} \frac{ax + b}{cx + d}, \quad d \neq 0$$



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10. Evaluate the following limit: $\lim_{x \rightarrow 3} \frac{\sqrt{2x + 3}}{x + 3}$



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11. Evaluate the following limit:

$$\lim_{x \rightarrow 1} \frac{1 + (x - 1)^2}{1 + x^2}$$



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12. Evaluate the following limit: $\lim_{x \rightarrow 2} (3 - x)$



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13. Evaluate the following limit: $\lim_{x \rightarrow 0} \frac{3x + 1}{x + 3}$



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14. Evaluate: $\lim_{x \rightarrow 2} \frac{x^3 - 6x^2 + 11x - 6}{x^2 - 6x + 8}$



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15. Evaluate : $\lim_{x \rightarrow 1} \left(\frac{2}{1 - x^2} + \frac{1}{x - 1} \right)$



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16.

Evaluate:

$$\lim_{x \rightarrow \sqrt{2}} \frac{x^9 - 3x^8 + x^6 - 9x^4 - 4x^2 - 16x + 84}{x^5 - 3x^4 - 4x + 12}$$



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17. Evaluate the following limit:

$$\lim_{x \rightarrow -5} \frac{2x^2 + 9x - 5}{x + 5}$$



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18. Evaluate the following limit: $\lim_{x \rightarrow 3} \frac{x^4 - 81}{x^2 - 9}$



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19. Evaluate the following limit:

$$\lim_{x \rightarrow -\frac{1}{2}} \frac{8x^3 + 1}{2x + 1}$$



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20. Evaluate the following limit: $\lim_{x \rightarrow 2} \frac{x^4 - 16}{x - 2}$



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21. Evaluate the following limit:

$$\lim_{x \rightarrow \sqrt{2}} \frac{x^2 - 2}{x^2 + \sqrt{2}x - 4}$$



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22. Evaluate the following limit:

$$\lim_{x \rightarrow \sqrt{3}} \frac{x^4 - 9}{x^2 + 4\sqrt{3}x - 15}$$



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23. Evaluate the following limit:

$$\lim_{x \rightarrow 1} \left(\frac{1}{x^2 + x - 2} - \frac{x}{x^3 - 1} \right)$$



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24. Evaluate the following limit:

$$\lim_{x \rightarrow 2} \left(\frac{1}{x - 2} - \frac{2}{x^2 - 2x} \right)$$



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25. Evaluate the following limit:

$$\lim_{x \rightarrow 2} \left(\frac{1}{x-2} - \frac{4}{x^3 - 2x^2} \right)$$



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26.
$$\lim_{x \rightarrow 1} \left(\frac{x^4 - 3x^2 + 2}{x^3 - 5x^2 + 3x + 1} \right)$$



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27. Evaluate the following limit:

$$\lim_{x \rightarrow -2} \frac{x^3 + x^2 + 4x + 12}{x^3 - 3x + 2}$$



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28. Evaluate the following limit:

$$\lim_{x \rightarrow 3} \frac{x^2 - 4x + 3}{x^2 - 2x - 3}$$



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29. Evaluate the following limit: $\lim_{x \rightarrow 2} \frac{x^3 - 8}{x^2 - 4}$



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30. Evaluate the following limit:

$$\lim_{x \rightarrow 4} \frac{x^2 - 7x + 12}{x^2 - 3x - 4}$$



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31. Evaluate the following limit:

$$\lim_{x \rightarrow 5} \frac{x^2 - 7x + 12}{x^2 - 3x - 4}$$



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32. Evaluate the following limit:

$$\lim_{x \rightarrow 5} \frac{x^2 - 9x + 20}{x^2 - 6x + 5}$$



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33. Evaluate the following limit:

$$\lim_{x \rightarrow 5} \frac{x^3 - 125}{x^2 - 7x + 10}$$



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34.
$$\lim_{x \rightarrow \sqrt{3}} \frac{x^2 - 3}{x^2 + 3\sqrt{3}x - 12}$$



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35. Evaluate the following limit:

$$\lim_{x \rightarrow 2} \left(\frac{x}{x-2} - \frac{4}{x^2 - 2x} \right)$$



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36. Evaluate the following limit:

$$\lim_{x \rightarrow 3} \left(\frac{1}{x-3} - \frac{2}{x^2 - 4x + 3} \right)$$



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37. Evaluate the following limit:

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



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38. Evaluate the following limit:

$$\lim_{x \rightarrow 3} \left(\frac{1}{x - 3} - \frac{3}{x^2 - 3x} \right)$$



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39. Evaluate the following limit:

$$\lim_{x \rightarrow 3} (x^2 - 9) \left(\frac{1}{x + 3} + \frac{1}{x - 3} \right)$$



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40. Evaluate the following limit:

$$\lim_{x \rightarrow 1} \frac{x^4 - 3x^3 + 2}{x^3 - 5x^2 + 3x + 1}$$



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41. Evaluate the following limit:

$$\lim_{x \rightarrow -2} \frac{x^3 + x^2 + 4x + 12}{x^3 - 3x + 2}$$



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42. Evaluate the following limit:

$$\lim_{x \rightarrow 2} \frac{x^3 + 3x^2 - 9x - 2}{x^3 - x - 6}$$



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43. Evaluate the following limit:

$$\lim_{x \rightarrow 3} \frac{x^2 - x - 6}{x^3 - 3x^2 + x - 3}$$



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44. Evaluate the following limit:

$$\lim_{x \rightarrow 1} \frac{x^3 + 3x^2 - 6x + 2}{x^3 + 3x^2 - 3x - 1}$$



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45. Evaluate the following limit:

$$\lim_{x \rightarrow 1} \frac{x^7 - 2x^5 + 1}{x^3 - 3x^2 + 2}$$



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46. Evaluate the following limit:

$$\lim_{x \rightarrow 0} \frac{\sqrt{1 + x + x^2} - 1}{x}$$



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47. Evaluate the following limit:

$$\lim_{x \rightarrow 0} \frac{\sqrt{a^2 + x^2} - a}{x^2}$$



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48. Evaluate the following limit:

$$\lim_{x \rightarrow 2} \frac{\sqrt{3 - x} - 1}{2 - x}$$



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49. Evaluate the following limit:

$$\lim_{x \rightarrow 1} \frac{x - 1}{\sqrt{x^2 + 3} - 2}$$

A. $1\sqrt{4}$

B. $2\sqrt{6}$

C. $2\sqrt{5}$

D. $\frac{2}{\sqrt{5}}$

Answer: $\frac{2}{\sqrt{5}}$



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50. Evaluate the following limit:

$$\lim_{x \rightarrow 1} \frac{\sqrt{5x - 4} - \sqrt{x}}{x - 1}$$

A. 7

B. $\frac{3}{4}$

C. 2

D. $\frac{6}{8}$

Answer: 2



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51. Evaluate the following limit:

$$\lim_{x \rightarrow 2} \frac{\sqrt{x^2 + 1} - \sqrt{5}}{x - 2}$$

A. $\frac{3}{9}$

B. $2\sqrt{3}$

C. $\frac{4}{\sqrt{6}}$

D. $\frac{2}{\sqrt{5}}$

Answer: $\frac{2}{\sqrt{5}}$



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52. Evaluate the following limit:

$$\lim_{x \rightarrow 7} \frac{4 - \sqrt{9 + x}}{1 - \sqrt{8 - x}}$$

A. $-\frac{3}{7}$

B. $\sqrt{6}$

C. $-\frac{1}{4}$

D. all of the above

Answer: $-\frac{1}{4}$



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53. Evaluate the following limit:

$$\lim_{x \rightarrow 2} \frac{\sqrt{1 + 4x} - \sqrt{5 + 2x}}{x - 2}$$

A. 5

B. $\frac{6}{8}$

C. $\sqrt{3}$

D. $\frac{1}{3}$

Answer: $\frac{1}{3}$



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54. Evaluate the following limit:

$$\lim_{x \rightarrow 0} \frac{2x}{\sqrt{a+x} - \sqrt{a-x}}$$



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55. Evaluate the following limit:

$$\lim_{x \rightarrow 0} \frac{\sqrt{1+x} - \sqrt{1-x}}{2x}$$



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56. Evaluate the following limit:

$$\lim_{x \rightarrow 3} \frac{x - 3}{\sqrt{x - 2} - \sqrt{4 - x}}$$



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57. Evaluate the following limit:

$$\lim_{x \rightarrow 1} \frac{\sqrt{5x - 4} - \sqrt{x}}{x - 1}$$



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58. Evaluate the following limit:

$$\lim_{x \rightarrow 3} \frac{\sqrt{x+3} - \sqrt{6}}{x^2 - 9}$$



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59. Find limit $\lim_{x \rightarrow 0} \frac{\sqrt{1+x} - 1}{x}$



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60. Evaluate the following limit:

$$\lim_{x \rightarrow 2} \frac{x - 2}{\sqrt{x} - \sqrt{2}}$$



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61. Evaluate the following limit:

$$\lim_{x \rightarrow 0} \frac{\sqrt{a+x} - \sqrt{a}}{x \sqrt{a^2 + ax}}$$



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62. Evaluate the following limit:

$$\lim_{x \rightarrow 1} \frac{\sqrt{5x-4} - \sqrt{x}}{x^3 - 1}$$



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63. Evaluate the following limit:

$$\lim_{x \rightarrow 1} \frac{\sqrt{3+x} - \sqrt{5-x}}{x^2 - 1}$$



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64. Evaluate the following limit:

$$\lim_{x \rightarrow 0} \frac{\sqrt{1+x^2} - \sqrt{1-x^2}}{x}$$



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65. Evaluate the following limit: $\lim_{x \rightarrow 4} \frac{2 - \sqrt{x}}{4 - x}$



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66. Evaluate the following limit:

$$\lim_{x \rightarrow 0} \frac{\sqrt{1+3x} - \sqrt{1-3x}}{x^2 - 1}$$



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67. Evaluate the following limit:

$$\lim_{x \rightarrow 1} \frac{\sqrt{3+x} - \sqrt{5-x}}{x^2 - 1}$$



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68. $\lim_{x \rightarrow \sqrt{10}} \frac{\sqrt{7 + 2x} - (\sqrt{5} + \sqrt{2})}{x^2 - 10}$ is equal

to



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69. Evaluate the following limit:

$$\lim_{x \rightarrow 0} \frac{\sqrt{1 + x + x^2} - \sqrt{x + 1}}{2x^2}$$



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70. Evaluate the following limit:

$$\lim_{x \rightarrow a} \frac{x - a}{\sqrt{x} - \sqrt{a}}$$



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71. Evaluate the following limit:

$$\lim_{x \rightarrow 0} \frac{\sqrt{2-x} - \sqrt{2+x}}{x}$$



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72. Evaluate the following limit:

$$\lim_{x \rightarrow 1} \frac{(2x - 3)(\sqrt{x} - 1)}{3x^2 + 3x - 6}$$



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73. Evaluate: $\lim_{x \rightarrow 2} \frac{x - 2}{\sqrt[3]{x} - \sqrt[3]{33}}$



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74. If $\lim_{x \rightarrow -a} \frac{x^9 + a^9}{x + a} = 9$, find the real value of a .



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75. Evaluate the following limit:

$$\lim_{x \rightarrow a} \frac{(x + 2)^{5/2} - (a + 2)^{5/2}}{x - a}$$



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76. Evaluate the following limit:

$$\frac{(1 + x)^6 - 1}{(1 + x)^2 - 1} \quad x \rightarrow 0$$



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77. Evaluate the following limit:

$$\left(\lim \right)_{x \rightarrow a} \frac{x^{5/7} - a^{5/7}}{x^{2/7} - a^{2/7}}$$



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78. Evaluate (i) $\lim_{x \rightarrow 1} \frac{x^{15} - 1}{x^{10} - 1}$ (ii)

$$\lim_{x \rightarrow 0} \frac{\sqrt{1+x} - 1}{x}$$



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79. Evaluate the following limit:

$$\left(\lim \right)_{x \rightarrow a} \frac{x^{2/3} - a^{2/3}}{x^{3/4} - a^{3/4}}$$



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80. Evaluate the following limit:

$$\lim_{x \rightarrow a} \frac{(x + 2)^{3/2} - (a + 2)^{3/2}}{x - a}$$



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81. Evaluate the following limit:

$$\lim_{x \rightarrow a} \frac{x^{2/7} - a^{2/7}}{x - a}$$



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82. Evaluate the following limit:

$$\lim_{x \rightarrow -1/2} \frac{8x^3 + 1}{2x + 1}$$



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83. Evaluate the following limit:

$$\lim_{x \rightarrow -1/2} \frac{8x^3 + 1}{2x + 1}$$



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84. Evaluate the following limit:

$$\lim_{x \rightarrow 4} \frac{x^3 - 64}{x^2 - 16}$$



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85. Evaluate the following limit:

$$\lim_{x \rightarrow -1} \frac{x^3 + 1}{x + 1}$$



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86. If $\lim_{x \rightarrow a} \frac{x^5 - a^5}{x - a} = 5$, then find the sum of

thelf lim-possible real values of a.



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87. If $\lim_{x \rightarrow a} \frac{x^5 - a^5}{x - a} = 5$, then find the sum of their lim-possible real values of a .



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88. If $\lim_{x \rightarrow a} \frac{x^9 - a^9}{x - a} = \lim_{x \rightarrow 5} (4 + x)$ find all possible values of a .



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89. If $\lim_{x \rightarrow a} \frac{x^3 - a^3}{x - a} = \lim_{x \rightarrow 1} \frac{x^4 - 1}{x - 1}$, find all possible value o a .



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90. Evaluate : $\lim_{x \rightarrow \infty} \frac{ax^2 + bx + c}{dx^2 + ex + f}$.



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91. Evaluate the following limit:

$$\lim_{x \rightarrow \infty} \frac{(3x - 1)(4x - 2)}{(x + 8)(x - 1)}$$



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92. Evaluate the following limit:

$$\lim_{x \rightarrow \infty} \frac{5x^3 - 6}{9 + 4x^3}$$



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93. Evaluate the following limit:

$$\lim_{x \rightarrow \infty} \sqrt{x+1} - \sqrt{x}$$



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94. Evaluate $\lim_{x \rightarrow \infty} \frac{3x^3 - 4x^2 + 6x - 1}{2x^3 + x^2 - 5x + 7}$



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95. Evaluate the following limit:

$$\lim_{x \rightarrow \infty} \sqrt{x^2 + 7x} - x$$



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96. Evaluate the following limit:

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



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97. Evaluate the following limit:

$$\lim_{n \rightarrow \infty} \{ \sqrt{x+1} - \sqrt{x} \} \sqrt{x+2}$$



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98. Evaluate the following limit:

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



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99. Evaluate the following limit:

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



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100. $\lim_{x \rightarrow \infty} \frac{x^4 + 7x^3 + 46x + a}{x^4 + 6}$ where a is a

non-zero real number.



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101. Evaluate the following limit:

$$\lim_{x \rightarrow -\infty} \left(\sqrt{x^2 - 8x} + x \right)$$



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102. Evaluate the following limit:

$$\lim_{x \rightarrow \infty} \frac{\sqrt{x^2 + a^2} - \sqrt{x^2 + b^2}}{\sqrt{x^2 + c^2} + \sqrt{x^2 + d^2}}$$



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103.
$$\lim_{n \rightarrow \infty} \frac{1^2 + 2^2 + 3^2 + \dots + n^2}{n^3}$$



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



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105. Evaluate the following limit: $\lim_{x \rightarrow 0} \frac{x^2}{\sin x^2}$



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106. Evaluate the following limit:

$$\lim_{x \rightarrow 0} \frac{\sin x \cos x}{3x}$$



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107. Evaluate the following limit:

$$\lim_{x \rightarrow 0} \frac{3 \sin x - 4 \sin^3 x}{x}$$



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108. $\lim_{x \rightarrow 0} \frac{\tan mx}{\tan nx}$



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109. Evaluate the following limit:

$$\left(\lim \right)_{x \rightarrow 0} \frac{\sin x^0}{x^0}$$



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110. Evaluate the following limit:

$$\left(\lim \right)_{x \rightarrow 0} \frac{\cos ax - \cos bx}{\cos cx - \cos dx}$$



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111. Evaluate the following limit:

$$\left(\lim \right)_{x \rightarrow 0} \frac{1 - \cos mx}{x^2}$$



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112. Evaluate the following limit:

$$\left(\lim \right)_{x \rightarrow 0} \frac{\cos 3x - \cos 7x}{x^2}$$



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113. Evaluate the following limit:

$$\left(\lim \right)_{x \rightarrow 0} \frac{x \cos x + 2 \sin x}{x^2 + \tan x}$$



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114. Evaluate the following limit:

$$\left(\lim \right)_{x \rightarrow 0} \frac{5x \cos x + 3 \sin x}{3x^2 + \tan x}$$



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115. Evaluate the following limit:

$$\left(\lim \right)_{x \rightarrow 0} \frac{\sin 5x - \sin 3x}{\sin x}$$



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116. Evaluate $\lim_{x \rightarrow 0} \frac{\tan 3x - 2x}{3x - \sin^2 x}$



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117. $\lim_{x \rightarrow 0} \frac{1 - \cos 2x + \tan^2 x}{x \sin x}$



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118. Evaluate the following limit:

$$\left(\lim \right)_{x \rightarrow 0} \frac{x^2 - \tan 2x}{\tan x}$$



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119. Evaluate the following limit:

$$\left(\lim \right)_{x \rightarrow 0} \frac{x \tan x}{1 - \cos x}$$



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120. Evaluate the following limit:

$$\left(\lim \right)_{x \rightarrow 0} \frac{\sin 2x (\cos 3x - 3 \cos x)}{x^3}$$



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121. Evaluate the following limit:

$$\left(\lim \right)_{x \rightarrow 0} \frac{x^3 \cot x}{1 - \cos x}$$



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122. Evaluate the following limit:

$$\left(\lim \right)_{x \rightarrow 0} \frac{\sin(3 + x) - \sin(3 - x)}{x}$$



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123. $\lim_{x \rightarrow 0} \frac{\tan 8x}{\sin 2x}$



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124. $\lim_{x \rightarrow 0} \frac{\sin 5x}{\tan 3x}$



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125. $\lim_{x \rightarrow 0} \frac{7x \cos x - 3 \sin x}{4x + \tan x}$



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126. Evaluate the following limit:

$(\lim)_{x \rightarrow 0} \frac{\tan^2 3x}{x^2}$



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127. Evaluate the following limit:

$$\left(\lim \right)_{x \rightarrow 0} \frac{3 \sin 2x + 2x}{3x + 2 \tan 3x}$$



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128. Evaluate the following limit:

$$\left(\lim \right)_{\theta \rightarrow 0} \frac{\sin 3\theta}{\tan 2\theta}$$



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129. Evaluate the following limit:

$$\lim_{x \rightarrow 0} \frac{\sin^2 4x^2}{x^4}$$



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130. Evaluate the following limit:

$$\lim_{x \rightarrow 0} \frac{2x - \sin x}{\tan x + x}$$



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131. Evaluate the following limit:

$$\lim_{x \rightarrow 0} \frac{\sin 3x - \sin x}{\sin x}$$



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132. Evaluate the following limit:

$$\lim_{x \rightarrow 0} \frac{\cos 3x - \cos 5x}{x^2}$$



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133. Evaluate the following limit:

$$\lim_{x \rightarrow 0} \frac{\sin(2 + x) - \sin(2 - x)}{x}$$



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134. Evaluate the following limit:

$$\lim_{x \rightarrow 0} \frac{\tan x - \sin x}{\sin 3x - x \sin x}$$



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135. Evaluate the following limit:

$$\lim_{x \rightarrow 0} \frac{1 - \cos 2x}{\cos 2x - \cos 8x}$$



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136. Evaluate the following limit:

$$\lim_{x \rightarrow \infty} \frac{\sin(a + x) + \sin(a - x) - 2 \sin a}{x \sin x}$$



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137. Evaluate the following limit:

$$\lim_{x \rightarrow 0} \frac{x^2 + 1 - \cos x}{x \sin x}$$



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138. Evaluate the following limit:

$$\lim_{x \rightarrow 0} \frac{2\sin x^0 - \sin 2x^0}{x^3}$$



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139. Evaluate the following limit:

$$\lim_{x \rightarrow 0} \frac{x \tan x}{1 - \cos 2x}$$



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140. Evaluate the following limit:

$$\lim_{x \rightarrow 0} \frac{\cos 2x - 1}{\cos x - 1}$$



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141. Evaluate the following limit:

$$\lim_{x \rightarrow 0} \frac{3 \sin^2 x - 2 \sin x^2}{3x^2}$$



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142. Evaluate the following limit:

$$\lim_{x \rightarrow 0} \frac{1 - \cos 4x}{x^2}$$



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143. $\lim_{x \rightarrow 0} \frac{1 - \cos 2x}{3 \tan^2 x}$



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144. Evaluate the following limit:

$$\lim_{x \rightarrow 0} \frac{ax + x \cos x}{b \sin x}$$



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145. Evaluate the following limit:

$$\lim_{x \rightarrow 0} \frac{2 \sin x - \sin 2x}{x^3}$$



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146. Evaluate the following limit:

$$\lim_{x \rightarrow 0} \frac{\cos ex - \cot x}{x}$$



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147. Evaluate the following limit:

$$\lim_{x \rightarrow 0} \frac{5x + 4 \sin 3x}{4 \sin 2x + 7x}$$



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148. Evaluate the following limit:

$$\lim_{x \rightarrow 0} (\cos ecx - \cot x)$$



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149. Evaluate the following limit:

$$\left(\lim \right)_{x \rightarrow 0} \frac{x \cos x - \sin x}{x^2 + \tan x}$$



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150. Evaluate the following limit:

$$\left(\lim \right)_{\theta \rightarrow 0} \frac{1 - \cos 4\theta}{1 - \cos 6\theta}$$



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151. Evaluate the following limit:

$$\left(\lim \right)_{\theta \rightarrow 0} \frac{\sin 4\theta}{\tan 3\theta}$$



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152. Evaluate the following limit:

$$\left(\lim \right)_{x \rightarrow 0} \frac{1 - \cos 5x}{1 - \cos 6x}$$



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153. Evaluate the following limit:

$$\left(\lim \right)_{x \rightarrow 0} \frac{\sin 3x + 7x}{4x + \sin 2x}$$



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154. Evaluate the following limit:

$$\left(\lim \right)_{x \rightarrow 0} \frac{3 \sin x - \sin 3x}{x^3}$$



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155. Evaluate the following limit:

$$\left(\lim \right)_{x \rightarrow 0} \frac{\sin ax + bx}{ax + \sin bx}$$



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156.

Evaluate:

$$\lim_{h \rightarrow 0} \frac{(a + h)^2 \sin(a + h) - a^2 \sin a}{h}$$



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157.

If

$$\left(\lim \right)_{x \rightarrow 0} kx \operatorname{cosec} x = \left(\lim \right)_{x \rightarrow 0} x \operatorname{cosec} kx$$

, find k



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158. Evaluate: $\left(\lim_{x \rightarrow \frac{\pi}{2}} \frac{\cot x}{\frac{\pi}{2} - x} \right)$



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159. Evaluate: $\left(\lim_{x \rightarrow \frac{\pi}{2}} \left(\frac{\pi}{2} - x \right) \tan x \right)$



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



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161. Evaluate the following limits:

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



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162. Evaluate the following limit:

$$\lim_{x \rightarrow \frac{\pi}{2}} \frac{\cos^2 x}{1 - \sin x}$$



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163. Evaluate the following limit:

$$\left(\lim \right)_{x \rightarrow a} \frac{\cos x - \cos a}{x - a}$$



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164. Evaluate the following limit:

$$\left(\lim \right)_{x \rightarrow \frac{\pi}{2}} \frac{1 - \sin x}{\left(\frac{\pi}{2} - x \right)^2}$$



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165. Evaluate the following limit:

$$\left(\lim \right)_{x \rightarrow \frac{\pi}{8}} \frac{\cot 4x - \cos 4x}{(\pi - 8x)^3}$$



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166. Evaluate the following limit:

$$\left(\lim \right)_{x \rightarrow \pi} \frac{\sqrt{5 + \cos x} - 2}{(\pi - x)^2}$$



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167. Evaluate the following limit:

$$\left(\lim \right)_{x \rightarrow a} \frac{\sin \sqrt{x} - \sin \sqrt{a}}{x - a}$$



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168. Evaluate the following limit:

$$\left(\lim \right)_{x \rightarrow \frac{\pi}{4}} \frac{f(x) - f\left(\frac{\pi}{4}\right)}{x - \frac{\pi}{4}}, \quad \text{where}$$

$$f(x) = \sin 2x$$



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169. Evaluate the following limit:

$$\lim_{x \rightarrow 1} \frac{1 - x^2}{\sin \pi x}$$



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170. Evaluate the following limit:

$$\lim_{x \rightarrow \pi} \frac{1 + \cos x}{\tan^2 x}$$



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171. Evaluate the following limit:

$$\left(\lim_{n \rightarrow \infty} \right) 2^{n-1} \sin \left(\frac{a}{2^n} \right)$$



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172. Evaluate the following limit: $\lim_{x \rightarrow \frac{\pi}{2}} \frac{\sin 2x}{\cos x}$



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173. Evaluate $\lim_{x \rightarrow \frac{\pi}{3}} \frac{\sqrt{1 - \cos 6x}}{\sqrt{2} \left(\frac{\pi}{3} - x \right)}$



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174. Evaluate the following limit:

$$\lim_{x \rightarrow \frac{\pi}{4}} \frac{1 - \tan x}{x - \frac{\pi}{4}}$$



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175. Evaluate the following limit:

$$\lim_{x \rightarrow \frac{\pi}{3}} \frac{\sqrt{3} - \tan x}{\pi - 3x}$$



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176. Evaluate the following limit:

$$\lim_{x \rightarrow \pi/2} \frac{\sqrt{2} - \sqrt{1 + \sin x}}{\cos^2 x}$$



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177. Evaluate the following limit:

$$\lim_{x \rightarrow \frac{\pi}{4}} \frac{\sqrt{2} - \cos x - \sin x}{\left(\frac{\pi}{4} - x\right)^2}$$



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178. Evaluate the following limit:

$$\lim_{x \rightarrow a} \frac{\cos x - \cos a}{\sqrt{x} - \sqrt{a}}$$



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179. Evaluate the following limit:

$$\lim_{x \rightarrow a} \frac{\cos \sqrt{x} - \cos \sqrt{a}}{x - a}$$



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180. Evaluate the following limit:

$$\lim_{x \rightarrow 1} \frac{1 + \cos \pi x}{(1 - x)^2}$$



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181. Evaluate $\lim_{x \rightarrow \frac{\pi}{4}} \frac{1 - \sin 2x}{1 + \cos 4x}$



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182. Evaluate: $\left(\lim_{n \rightarrow \infty} n \cos \left(\frac{\pi}{4n} \right) \sin \left(\frac{\pi}{4n} \right) \right)$



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183. Evaluate the following limit:

$$\lim_{n \rightarrow \infty} \frac{\sin\left(\frac{a}{2^n}\right)}{\sin\left(\frac{b}{2^n}\right)}$$



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184. Evaluate the following limit:

$$\lim_{x \rightarrow 2} \frac{x^2 - x - 2}{x^2 - 2x + \sin(x - 2)}$$



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185. $\lim_{x \rightarrow 1} (1 - x) \frac{\tan(\pi x)}{2} = _ _ _$



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186. The value of $\lim_{x \rightarrow \pi} \frac{\sqrt{2 + \cos x} - 1}{(x - \pi)^2}$



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187. Evaluate the following limit:

$$\lim_{x \rightarrow 1} \frac{1 - \frac{1}{x}}{\sin \pi(x - 1)}$$



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188. Evaluate the following limit:

$$\lim_{x \rightarrow \frac{\pi}{4}} \frac{\sqrt{2} - \cos x - \sin x}{(4x - \pi)^2}$$



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189. Evaluate the following limit:

$$\lim_{x \rightarrow \frac{\pi}{4}} \frac{\cos x - \sin x}{\left(\frac{\pi}{4} - x\right)(\cos x + \sin x)}$$



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190. Evaluate the following limit:

$$\lim_{x \rightarrow \frac{\pi}{4}} \frac{1 - \tan x}{1 - \sqrt{2} \sin x}$$



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191. Evaluate the following limit:

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



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192. Evaluate the following limit:

$$\lim_{x \rightarrow \pi} \frac{1 + \cos x}{\tan^2 x}$$



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193. Evaluate the following limit:

$$\lim_{x \rightarrow \frac{\pi}{6}} \frac{\cot^2 x - 3}{\cos ecx - 2}$$



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194. Evaluate the following limit:

$$\lim_{x \rightarrow \frac{\pi}{4}} \frac{2 - \operatorname{cosec}^2 x}{1 - \cot x}$$



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195. The value of $\lim_{x \rightarrow \pi} \frac{\sqrt{2 + \cos x} - 1}{(x - \pi)^2}$



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196. Evaluate the following limit:

$$\lim_{x \rightarrow \frac{3\pi}{2}} \frac{1 + \cos e c^3 x}{\cot^2 x}$$



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197. Evaluate: $\lim_{x \rightarrow e} \frac{\log x - 1}{x - e}$



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198. Evaluate the following limit:

$$\lim_{x \rightarrow 0} \frac{5^x - 1}{\sqrt{4 + x} - 2}$$



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199. Evaluate the following limit:

$$\lim_{x \rightarrow 0} \frac{a^x + b^x - 2}{x^2}$$



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200. Evaluate the following limit:

$$\lim_{x \rightarrow 0} \frac{8^x - 4^x - 2^x + 1}{x^2}$$



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201. Evaluate the following limit:

$$\lim_{x \rightarrow 0} \frac{5^x + 3^x + 2^x - 3}{x}$$



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202. Evaluate the following limit:

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



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203. Evaluate the following limit:

$$\lim_{x \rightarrow 0} \frac{e^{\sin x} - 1}{x}$$



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204. Evaluate: $\lim_{x \rightarrow a} \frac{\log x - \log a}{x - a}$



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205. Evaluate: $\lim_{x \rightarrow a} \frac{\log x - \log a}{x - a}$



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206. Evaluate the following limit:

$$\lim_{x \rightarrow 0} \frac{\log(2 + x) + \log 0.5}{x}$$



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207. Evaluate the following limit:

$$\lim_{x \rightarrow 0} \frac{\log(3 + x) - \log(3 - x)}{x}$$



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208. Evaluate the following limit:

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



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209. Evaluate the following limit:

$$\left(\lim \right)_{x \rightarrow 5} \frac{e^x - e^5}{x - 5}$$



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210. Evaluate the following limit:

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



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211. Evaluate the following limit:

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



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212. Evaluate the following limit:

$$\lim_{x \rightarrow 0} (\cos x + a \sin bx)^{1/x}$$



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213. Evaluate the following limit:

$$\lim_{x \rightarrow \infty} \left\{ \frac{x^2 + 2x + 3}{2x^2 + x + 5} \right\}^{\frac{3x-2}{3x+2}}$$



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214. Write the value of $\lim_{x \rightarrow 0} \frac{\sqrt{1 - \cos 2x}}{x}$



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215. Write the value of $\lim_{x \rightarrow 0^+} [x]$



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216. Write the value of $\lim_{x \rightarrow 0^-} \frac{\sin[x]}{[x]}$



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217. Write the value of $\lim_{x \rightarrow \infty} \frac{\sin x}{x}$



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218. Write the value of $\lim_{x \rightarrow 0} \frac{\sin x^\circ}{x}$



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219. Write the value of $\lim_{x \rightarrow 0} \frac{\sin x}{\sqrt{1+x} - 1}$



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220. Write the value of

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



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221. Write the value of

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



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222. Write the value of $\lim_{x \rightarrow 0^-} [x]$



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223. Write the value of $\lim_{x \rightarrow 1^-} x - [x]$



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224. Write the value of $\lim_{x \rightarrow \pi} \frac{\sin x}{x - \pi}$



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225. Write the value of $\lim_{x \rightarrow 2} \frac{|x - 2|}{x - 2}$



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226. Write the value of $\lim_{x \rightarrow 0^-} \frac{\sin x}{\sqrt{x}}$



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227. Write the value of

$$\lim_{x \rightarrow -\infty} (3x + \sqrt{9x^2 - x})$$



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228. Write the value of $(\lim)_{x \rightarrow \pi/2} \frac{2x - \pi}{\cos x}$



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229. $\lim_{n \rightarrow \infty} \frac{1^2 + 2^2 + 3^2 + \dots + n^2}{n^3}$ is equal to

a. 1 b. c. 1/3 d. 0



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230. $\lim_{x \rightarrow 0} \frac{\sin 2x}{x}$ is equal to a. 1 b. 1/2 c. 2 d.

0



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231. If $f(x) = x \sin\left(\frac{1}{x}\right)$, $x \neq 0$ then

$\lim_{x \rightarrow 0} f(x) =$ a. 1 b. -1 c. 0 d. does not exist



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232. $\lim_{x \rightarrow 0} \frac{1 - \cos 2x}{x}$ is a. 1 b. 2 c. 4 d. 0



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233. $\lim_{x \rightarrow 0} \frac{x}{\tan x}$ is a. 1 b. 0 c. 4 d. not defined



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234. $\lim_{x \rightarrow \infty} \frac{\sin x}{x}$ equals a. 1 b. 0 c. ∞ d. does not exist



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235. $\lim_{x \rightarrow 0} \frac{\sin x}{x}$



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236. $\lim_{x \rightarrow a} \frac{x^n - a^n}{x - a}$ is equal to

a. na^n

b. na^{n-1}

c. na

d. 1



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237. $\lim_{x \rightarrow \infty} \frac{\sqrt{x^2 - 1}}{2x + 1}$ is equal to

a. 0

b . - 1

c. 1/2

d. 1



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238. If $f(x) = \begin{cases} x \frac{\sin 1}{x}, & x \neq 0, \\ x = 0 \end{cases}$

, then $\lim_{x \rightarrow 0} f(x)$ equals a. 1 b . 0 c. -1 d. none

of these



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239. $\lim_{x \rightarrow \infty} a^x \sin\left(\frac{b}{a^x}\right)$, $a, b > 1$ is equal to

a. b

b. a

c. $a(\log)_e b$

d. $b(\log)_e a$



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240. $\lim_{\theta \rightarrow \pi/2} \frac{1 - \sin \theta}{(\pi/2 - \theta) \cos \theta}$ is equal to a. 1 b

. -1 c. 1/2 d. -1/2



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241. The value of $\lim_{x \rightarrow \pi/2} (\sec x - \tan x)$ is a. 1

b . 0 c. 2 d. -1



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242. The value of $\lim_{x \rightarrow \infty} \frac{n!}{(n+1)! - (n)!}$ is a.

1 b . -1 c. 0 d. none of these



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243. The value of $\lim_{n \rightarrow \infty} \frac{(n+2)! + (n+1)!}{(n+2)! - (n+1)!}$

is a. 1 b. -1 c. 0 d. none of these



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244. The value of

$\lim_{n \rightarrow \infty} \left\{ \frac{1 + 2 + 3 + \dots + n}{n + 2} - \frac{n}{2} \right\}$ is a. 1 b. -1

c. 1/2 d. -1/2



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245. $\lim_{x \rightarrow \infty} \frac{|x|}{x}$ is equal to a. 1 b. -1 c. 0 d.

none of these



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246. $\lim_{x \rightarrow 0} \frac{|\sin x|}{x}$ is a. 1 b. -1 c. 0 d. none of

these



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