

Find the limit. Be careful! L'Hopital's rule is not always needed and may not (directly) apply!
Clicking on the check marks will take you to Wolfram Alpha's solutions.

1. $\lim_{x \rightarrow 3} \frac{x-3}{3x^2-13x+12}$ ✓

2. $\lim_{x \rightarrow 0} \frac{2 \cosh(x) - 2}{1 - \cos(2x)}$ ✓

3. $\lim_{x \rightarrow 0} \frac{x - \arctan(x)}{x^3}$ ✓

4. $\lim_{x \rightarrow 0} \frac{x + \tan(x)}{\sin(x)}$ ✓

5. $\lim_{t \rightarrow 0} \frac{5^t - 3^t}{t}$ ✓

6. $\lim_{x \rightarrow 1} \frac{\ln(x)}{x-1}$ ✓

7. $\lim_{x \rightarrow \infty} \frac{\ln(x)}{\sqrt[3]{x}}$ ✓

8. $\lim_{t \rightarrow 0} \frac{\sin(6t)}{\sinh(2t)}$ ✓

9. $\lim_{x \rightarrow 0} \frac{e^x - 1 - x - x^2/2}{x^3}$ ✓

10. $\lim_{x \rightarrow 0} \frac{\arcsin(x)}{x}$ ✓

11. $\lim_{x \rightarrow 0} \frac{1 - e^{2x}}{\sec(x)}$ ✓

12. $\lim_{x \rightarrow 2} \frac{\ln(5x-9)}{x^3-8}$ ✓

13. $\lim_{x \rightarrow 1} \frac{\ln(x)}{\tan(\pi x)}$ ✓

14. $\lim_{x \rightarrow -\infty} x^2 e^x$ ✓

15. $\lim_{x \rightarrow 0^+} \sin(x) \ln(x)$ ✓

16. $\lim_{x \rightarrow \infty} x - \ln(x)$ ✓

17. $\lim_{x \rightarrow \infty} x^{1/x}$ ✓

18. $\lim_{x \rightarrow 0^+} x^{1/x}$ ✓

19. $\lim_{x \rightarrow 0^+} (\cos(x))^{1/x^2}$ ✓

20. $\lim_{x \rightarrow 0} (1+x)^{1/x}$ ✓

21. $\lim_{x \rightarrow 0^+} x^{\sin(x)}$ ✓

22. $\lim_{x \rightarrow (\pi/2)^-} (\tan(x))^{\cos(x)}$ ✓

23. $\lim_{x \rightarrow \infty} (\ln(x))^{1/x}$ ✓

24. $\lim_{x \rightarrow \infty} (3^x + 5^x)^{1/x}$ ✓

Answers:

1. $\lim_{x \rightarrow 3} \frac{x-3}{3x^2-13x+12} = 1/5$

2. $\lim_{x \rightarrow 0} \frac{2 \cosh(x) - 2}{1 - \cos(2x)} = 1/2$

3. $\lim_{x \rightarrow 0} \frac{x - \arctan(x)}{x^3} = 1/3$

4. $\lim_{x \rightarrow 0} \frac{x + \tan(x)}{\sin(x)} = 2$

5. $\lim_{t \rightarrow 0} \frac{5^t - 3^t}{t} = \ln(5/3)$

6. $\lim_{x \rightarrow 1} \frac{\ln(x)}{x-1} = 1$

7. $\lim_{x \rightarrow \infty} \frac{\ln(x)}{\sqrt[3]{x}} = 0$

8. $\lim_{t \rightarrow 0} \frac{\sin(6t)}{\sinh(2t)} = 3$

9. $\lim_{x \rightarrow 0} \frac{e^x - 1 - x - x^2/2}{x^3} = 1/6$

10. $\lim_{x \rightarrow 0} \frac{\arcsin(x)}{x} = 1$

11. $\lim_{x \rightarrow 0} \frac{1 - e^{2x}}{\sec(x)} = 0$

12. $\lim_{x \rightarrow 2} \frac{\ln(5x-9)}{x^3-8} = 5/12$

13. $\lim_{x \rightarrow 1} \frac{\ln(x)}{\tan(\pi x)} = 1/\pi$

14. $\lim_{x \rightarrow -\infty} x^2 e^x = 0$

15. $\lim_{x \rightarrow 0^+} \sin(x) \ln(x) = 0$

16. $\lim_{x \rightarrow \infty} x - \ln(x) = \infty$

17. $\lim_{x \rightarrow \infty} x^{1/x} = 1$

18. $\lim_{x \rightarrow 0^+} x^{1/x} = 0$

19. $\lim_{x \rightarrow 0^+} (\cos(x))^{1/x^2} = 1/\sqrt{e}$

20. $\lim_{x \rightarrow 0} (1+x)^{1/x} = e$

21. $\lim_{x \rightarrow 0^+} x^{\sin(x)} = 1$

22. $\lim_{x \rightarrow (\pi/2)^-} (\tan(x))^{\cos(x)} = 1$

23. $\lim_{x \rightarrow \infty} (\ln(x))^{1/x} = 1$

24. $\lim_{x \rightarrow \infty} (3^x + 5^x)^{1/x} = 5$