

Find the Limit.

1. $\lim_{x \rightarrow 0} \frac{\sin(5x)}{\cos(4x)} =$

2. $\lim_{x \rightarrow 0} \frac{\sin^2(3x)}{x^2 \cos(x)} =$

3. $\lim_{x \rightarrow 0} \frac{\sin(5x)}{\sin\left(\frac{1}{3}x\right)} =$

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

5. $\lim_{x \rightarrow \frac{\pi}{2}} \frac{1 + \sin(x)}{1 - \cos(x)} =$

6. $\lim_{x \rightarrow \infty} \frac{\cos(2x)}{x^2} =$

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

8. $\lim_{x \rightarrow b} \frac{4a^2 - x^2}{2a + x} =$

9. $\lim_{x \rightarrow -\infty} \frac{8x^3 - 5x}{x^2 - 3x} =$

10. $\lim_{x \rightarrow \infty} \frac{x^2 + x^4}{x^2 + x^6} =$

11. $\lim_{x \rightarrow 2} \frac{4x^3 - 32}{5x^2 - 20} =$

12. $\lim_{x \rightarrow 4^-} \frac{5}{x - 4} =$

13. $\lim_{x \rightarrow 0^+} \frac{4}{x} \sin\left(\frac{x}{5}\right) =$

14. $\lim_{x \rightarrow 1} \frac{4x^3 - 5}{5x^2 - 6} =$

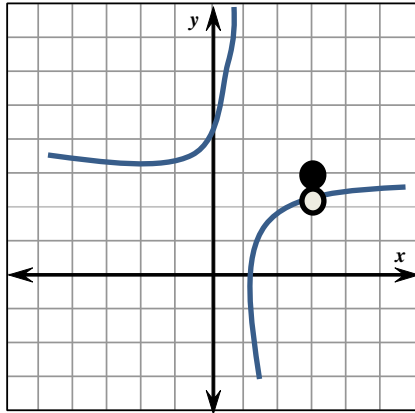
15. $\lim_{x \rightarrow 2^+} \frac{2x - 2}{x - 4} =$

16. $\lim_{x \rightarrow \infty} \frac{8x^2 - 2x^3}{2x^2 + 4x} =$

17. $\lim_{h \rightarrow 0} \frac{[4(x + h) - 1] - (4x - 1)}{h} =$

18. $\lim_{x \rightarrow -15^-} \frac{|x + 15|}{x + 15} =$

19. Use the graph of $f(x)$ below to answer A – C.



A. Use the 3 –part definition of continuity to show if $f(x)$ is continuous at $x = 3$.

B. What type(s) of discontinuity are shown in the graph of $f(x)$?

C. Is there a removable discontinuity? If so, assign a value to remove it.

20. If $f(x) = \begin{cases} 2x - 1 & \text{if } x \leq 1 \\ -3x & \text{if } x > 1 \end{cases}$, use the definition to show if $f(x)$ continuous at $x = 1$.

21. If $h(x) = \begin{cases} \frac{x^2 + 6x + 8}{x + 2} & x \neq -2 \\ 2 & x = -2 \end{cases}$ use the definition to show if $h(x)$ continuous at $x = -2$.

22. If $f(x) = \frac{x^3 + 8}{x + 2}$, use the definition to show if $f(x)$ continuous at $x = -2$.

23. When $f(x) = \frac{x^3 + 64}{x + 4}$, then $f(x)$ has continuous at a point of discontinuity. Assign a value to $f(x)$ that removes the discontinuity.

24.

A. $\lim_{x \rightarrow 1^+} f(x) =$

B. $\lim_{x \rightarrow 1^-} f(x) =$

C. $\lim_{x \rightarrow 1} f(x) =$

D. $\lim_{x \rightarrow -1} f(x) =$

E. $\lim_{x \rightarrow 2} f(x) =$

