

**In Exercises 5–22, find the limit.**

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|--|---|
| 5. $\lim_{x \rightarrow 2} x^4$                      | 6. $\lim_{x \rightarrow -2} x^3$                        |
| 7. $\lim_{x \rightarrow 0} (2x - 1)$                 | 8. $\lim_{x \rightarrow -3} (3x + 2)$                   |
| 9. $\lim_{x \rightarrow -3} (x^2 + 3x)$              | 10. $\lim_{x \rightarrow 1} (-x^2 + 1)$                 |
| 11. $\lim_{x \rightarrow -3} (2x^2 + 4x + 1)$        | 12. $\lim_{x \rightarrow 1} (3x^3 - 2x^2 + 4)$          |
| 13. $\lim_{x \rightarrow 2} \frac{1}{x}$             | 14. $\lim_{x \rightarrow -3} \frac{2}{x + 2}$           |
| 15. $\lim_{x \rightarrow 1} \frac{x - 3}{x^2 + 4}$   | 16. $\lim_{x \rightarrow 3} \frac{2x - 3}{x + 5}$       |
| 17. $\lim_{x \rightarrow 7} \frac{5x}{\sqrt{x + 2}}$ | 18. $\lim_{x \rightarrow 3} \frac{\sqrt{x + 1}}{x - 4}$ |
| 19. $\lim_{x \rightarrow 3} \sqrt{x + 1}$            | 20. $\lim_{x \rightarrow 4} \sqrt[3]{x + 4}$            |
| 21. $\lim_{x \rightarrow -4} (x + 3)^2$              | 22. $\lim_{x \rightarrow 0} (2x - 1)^3$                 |

**In Exercises 23–26, find the limits.**

23.  $f(x) = 5 - x$ ,  $g(x) = x^3$
- |                                   |                                   |                                      |
|-----------------------------------|-----------------------------------|--------------------------------------|
| (a) $\lim_{x \rightarrow 1} f(x)$ | (b) $\lim_{x \rightarrow 4} g(x)$ | (c) $\lim_{x \rightarrow 1} g(f(x))$ |
|-----------------------------------|-----------------------------------|--------------------------------------|
24.  $f(x) = x + 7$ ,  $g(x) = x^2$
- |                                    |                                   |                                       |
|------------------------------------|-----------------------------------|---------------------------------------|
| (a) $\lim_{x \rightarrow -3} f(x)$ | (b) $\lim_{x \rightarrow 4} g(x)$ | (c) $\lim_{x \rightarrow -3} g(f(x))$ |
|------------------------------------|-----------------------------------|---------------------------------------|
25.  $f(x) = 4 - x^2$ ,  $g(x) = \sqrt{x + 1}$
- |                                   |                                   |                                      |
|-----------------------------------|-----------------------------------|--------------------------------------|
| (a) $\lim_{x \rightarrow 1} f(x)$ | (b) $\lim_{x \rightarrow 3} g(x)$ | (c) $\lim_{x \rightarrow 1} g(f(x))$ |
|-----------------------------------|-----------------------------------|--------------------------------------|
26.  $f(x) = 2x^2 - 3x + 1$ ,  $g(x) = \sqrt[3]{x + 6}$
- |                                   |                                    |                                      |
|-----------------------------------|------------------------------------|--------------------------------------|
| (a) $\lim_{x \rightarrow 4} f(x)$ | (b) $\lim_{x \rightarrow 21} g(x)$ | (c) $\lim_{x \rightarrow 4} g(f(x))$ |
|-----------------------------------|------------------------------------|--------------------------------------|

In Exercises 27–36, find the limit of the trigonometric function.

27.  $\lim_{x \rightarrow \pi/2} \sin x$

28.  $\lim_{x \rightarrow \pi} \tan x$

29.  $\lim_{x \rightarrow 2} \cos \frac{\pi x}{3}$

30.  $\lim_{x \rightarrow 1} \sin \frac{\pi x}{2}$

31.  $\lim_{x \rightarrow 0} \sec 2x$

32.  $\lim_{x \rightarrow \pi} \cos 3x$

33.  $\lim_{x \rightarrow 5\pi/6} \sin x$

34.  $\lim_{x \rightarrow 5\pi/3} \cos x$

35.  $\lim_{x \rightarrow 3} \tan\left(\frac{\pi x}{4}\right)$

36.  $\lim_{x \rightarrow 7} \sec\left(\frac{\pi x}{6}\right)$

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In Exercises 37–40, use the information to evaluate the limits.

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

$\lim_{x \rightarrow c} g(x) = 3$

(a)  $\lim_{x \rightarrow c} [5g(x)]$

(b)  $\lim_{x \rightarrow c} [f(x) + g(x)]$

(c)  $\lim_{x \rightarrow c} [f(x)g(x)]$

(d)  $\lim_{x \rightarrow c} \frac{f(x)}{g(x)}$

39.  $\lim_{x \rightarrow c} f(x) = 4$

(a)  $\lim_{x \rightarrow c} [f(x)]^3$

(b)  $\lim_{x \rightarrow c} \sqrt{f(x)}$

(c)  $\lim_{x \rightarrow c} [3f(x)]$

(d)  $\lim_{x \rightarrow c} [f(x)]^{3/2}$

38.  $\lim_{x \rightarrow c} f(x) = \frac{3}{2}$

$\lim_{x \rightarrow c} g(x) = \frac{1}{2}$

(a)  $\lim_{x \rightarrow c} [4f(x)]$

(b)  $\lim_{x \rightarrow c} [f(x) + g(x)]$

(c)  $\lim_{x \rightarrow c} [f(x)g(x)]$

(d)  $\lim_{x \rightarrow c} \frac{f(x)}{g(x)}$

40.  $\lim_{x \rightarrow c} f(x) = 27$

(a)  $\lim_{x \rightarrow c} \sqrt[3]{f(x)}$

(b)  $\lim_{x \rightarrow c} \frac{f(x)}{18}$

(c)  $\lim_{x \rightarrow c} [f(x)]^2$

(d)  $\lim_{x \rightarrow c} [f(x)]^{2/3}$