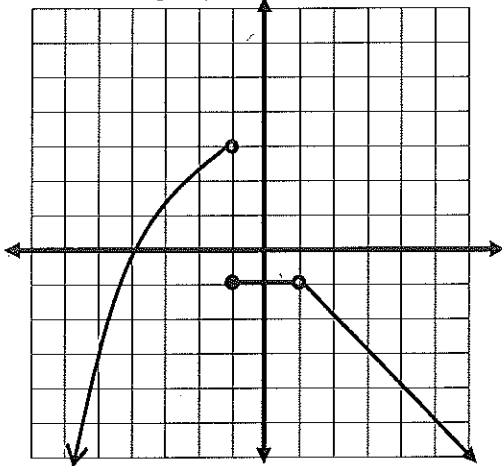


Chapter 12 Review: Piecewise and Limits

Use the graph to find the requested values.



- 1) $\lim_{x \rightarrow -1^-} f(x) = 3$
- 2) $\lim_{x \rightarrow -4} f(x) = 0$
- 3) $\lim_{x \rightarrow -1} f(x) = DNE$
- 4) $\lim_{x \rightarrow \infty} f(x) = -\infty$
- 5) $\lim_{x \rightarrow \infty} f(x) = -\infty$
- 6) $f(1) = DNE$
- 7) $\lim_{x \rightarrow 3^+} f(x) = -3$
- 8) $f(-4) = 0$
- 9) $f(-1) = -1$

Using the given piecewise function, find the requested values and justify your answers.

$$f(x) = \begin{cases} x^2 - 6x - 2 & \text{if } x \leq -1 \\ \frac{x^2 + 4}{x + 2} & \text{if } -1 < x \leq 3 \\ -2x + 5 & \text{if } x > 3 \end{cases}$$

- 10) $\lim_{x \rightarrow -1^+} f(x) = 5$
 $1 + 6 - 2$
- 11) $\lim_{x \rightarrow 1^+} f(x) = 5$
 $\frac{1}{1}$
- 12) $\lim_{x \rightarrow -1} f(x) = 5$
- 13) $\lim_{x \rightarrow 3} f(x) = DNE$
 $\frac{13}{4}$
- 14) $f(2) = 2$
 $\frac{4}{4}$
- 15) $f(4) = -3$
- 16) $\lim_{x \rightarrow 4.5} f(x) = -4$
- 17) $f(-1) = 5$
 $1 + 6 - 2$
- 18) $f(3) = \frac{13}{5}$

Find the following limits. If a graphing calculator was used, write how it was used.

- 19) $\lim_{x \rightarrow \infty} \frac{x^2 - 2x - 8}{x - 4} = -\infty$
- 20) $\lim_{x \rightarrow 4} \frac{x^2 - 2x - 8}{x - 4} = 6$
 $(x-4)(x+2)$
- 21) $\lim_{x \rightarrow 3} \frac{5x - 9}{x^2 - 5} = \frac{6}{4} = \frac{3}{2}$
- 22) $\lim_{x \rightarrow \infty} \frac{2 - 6x - 3x^2}{2x^3 + 8x - 2} = 0$
- 23) $\lim_{x \rightarrow 2} \frac{5x}{x^2 + 3x - 10} = DNE$
 $(x+5)(x-2)$
- 24) $\lim_{x \rightarrow 0} \frac{\sin x}{x} = 1$
- 25) $\lim_{x \rightarrow 1} \frac{x^2 + 9x - 10}{x^3 - 1} = \frac{11}{3}$
 $(x+10)(x-1)$ and $(x-1)(x^2+x+1)$
- 26) $\lim_{x \rightarrow \infty} \frac{4x^3 - 6x^6 - 6}{5x^6 + 3x^3 - 5x^2} = \frac{-6}{5}$
- 27) $\lim_{x \rightarrow \infty} \frac{x - 6}{\sqrt{2x^2 + 5}} = \frac{\sqrt{2}}{2}$
- 28) $\lim_{x \rightarrow 1} \frac{x}{|x - 1|} = DNE$
- 29) $\lim_{x \rightarrow 3} 9 = 9$
- 30) $\lim_{x \rightarrow \infty} 4x - 6 = -\infty$