

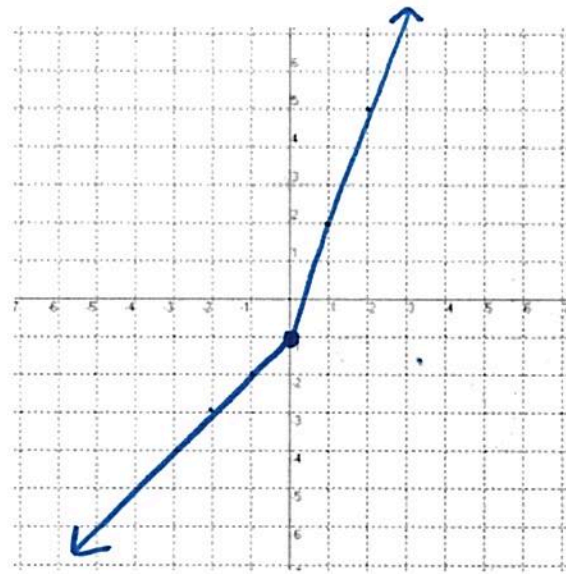
PreAP Precal
Practice with Piecewise and Limits

Name Key

1. Graph the function. (Show a sketch of the graph.) Use the graph to find the indicated limit.

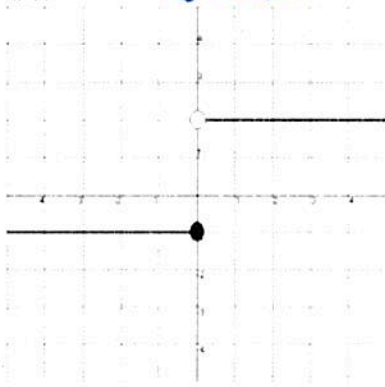
$$\lim_{x \rightarrow 0} f(x), \quad f(x) = \begin{cases} x-1 & x < 0 \\ 3x-1 & x \geq 0 \end{cases}$$

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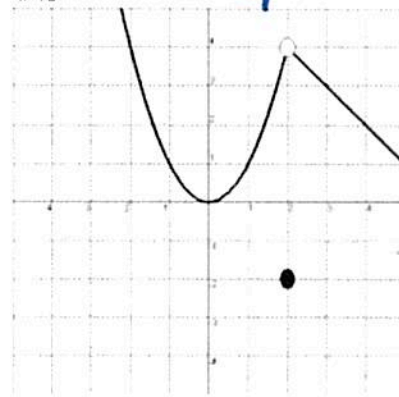


Give the limit of the following graph where $f(x)$ is the graph shown.

2. $\lim_{x \rightarrow 0} f(x) =$ ONE



3. $\lim_{x \rightarrow 2} f(x) =$ 4



Find the limit algebraically.

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

$\frac{2}{4}$

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

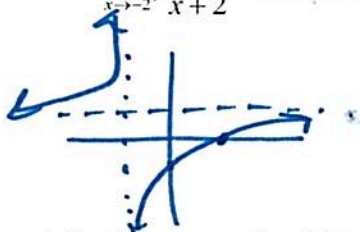
$$\frac{x^2(x+1) + 3(x+1)}{x^3(x+1) + 2(x+1)} = \frac{x^2+3}{x^3+2}$$

$\frac{4}{1}$

6. $\lim_{x \rightarrow 2} \frac{|x-2|}{x-2} = \underline{\text{DNE}}$

7. $\lim_{x \rightarrow -1} (4x^3 - 5x + 1) = \underline{2}$

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

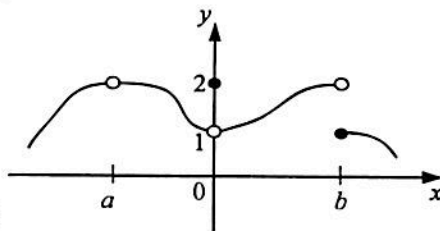


9. $\lim_{x \rightarrow 4} \frac{2-\sqrt{x}}{4-x} = \underline{1/4}$

$$\frac{2-\sqrt{x}}{4-x} \cdot \frac{2+\sqrt{x}}{2+\sqrt{x}} = \frac{4-x}{(4-x)(2+\sqrt{x})} = \frac{1}{2+\sqrt{x}}$$

10. The graph of the function f is shown in the figure. Which of the following statements about f is true?

- ~~A) $f(a)$ exists~~
- B) $\lim_{x \rightarrow a} f(x) = 2$ ✓**
- ~~C) $\lim_{x \rightarrow b} f(x) = 1$~~
- ~~D) $\lim_{x \rightarrow b^-} f(x) = \lim_{x \rightarrow b^+} f(x)$~~
- ~~E) f is continuous at $x = 0$~~

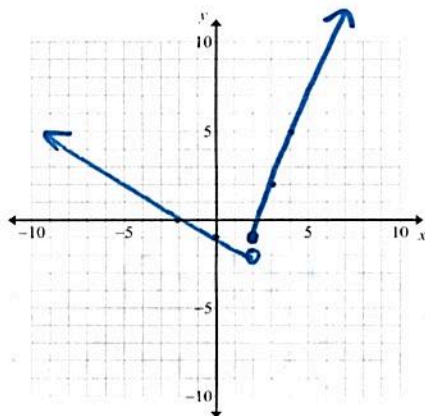


11. Evaluate the function below for the given value of x .

$$f(x) = \begin{cases} 9x-4 & x > 3 \\ \frac{1}{2}x+1 & x \leq 3 \end{cases}$$

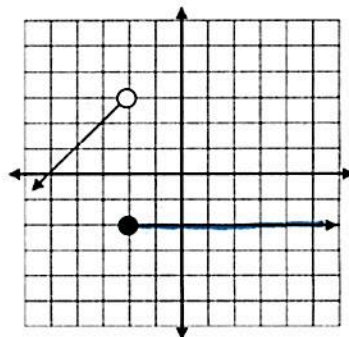
- a) $f(-4) = \underline{-1}$ b) $f(2) = \underline{2}$ c) $f(3) = \underline{\frac{5}{2}}$

12. Graph the piecewise function: $f(x) = \begin{cases} -\frac{1}{2}x-1 & x < 2 \\ 3x-7 & x \geq 2 \end{cases}$



13. Write a piecewise function for the graph

shown.



$$f(x) = \begin{cases} x+5, & x < -2 \\ -2, & x \geq -2 \end{cases}$$

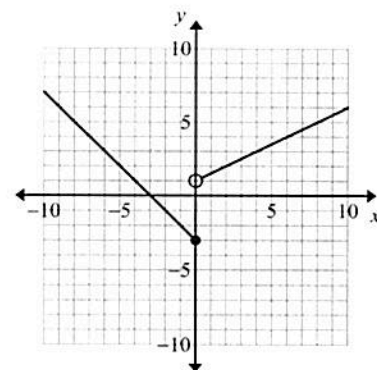
14. Which function is represented by the graph?

A. $f(x) = \begin{cases} -x-3, & \text{if } x \leq 0 \\ \frac{1}{2}x+1, & \text{if } x > 0 \end{cases}$

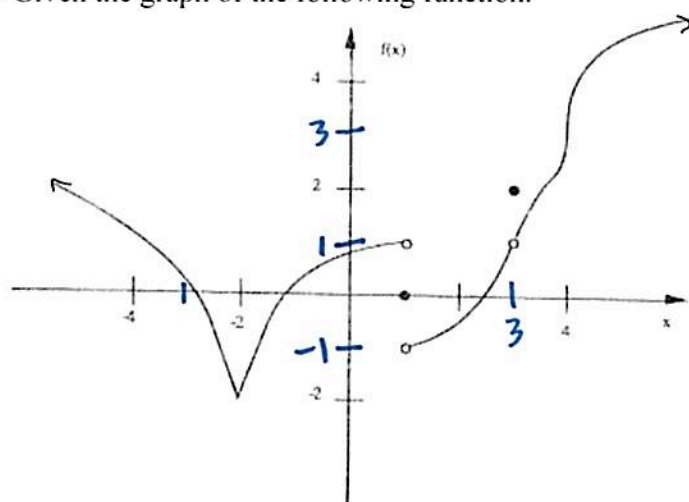
C. $f(x) = \begin{cases} -x+3, & \text{if } x \leq 0 \\ \frac{1}{2}x+1, & \text{if } x > 0 \end{cases}$

B. $f(x) = \begin{cases} x-3, & \text{if } x \leq 0 \\ -\frac{1}{2}x+1, & \text{if } x > 0 \end{cases}$

D. $f(x) = \begin{cases} x+3, & \text{if } x \leq 0 \\ -\frac{1}{2}x+1, & \text{if } x > 0 \end{cases}$



15. Given the graph of the following function.



Find the following:

A) $f(1)$ 0

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

C) $\lim_{x \rightarrow 1^+} f(x)$ -1

D) $\lim_{x \rightarrow 1} f(x)$ DNE

E) $f(3)$ 2

F) $\lim_{x \rightarrow 3^-} f(x)$ 1

G) $\lim_{x \rightarrow 3^+} f(x)$ 1

H) $\lim_{x \rightarrow 3} f(x)$ 1

I) $\lim_{x \rightarrow -2} f(x)$ -2

J) $\lim_{x \rightarrow 0} f(x)$ $\approx .9$

K) $\lim_{x \rightarrow -3} f(x)$ $\approx .1$

