1.3 Finding Limits from Graphs

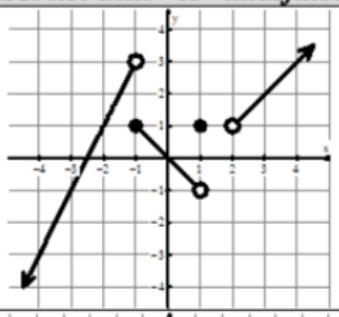
Calculus

Solutions

Practice

For 1-3, give the value of each statement. If the value does not exist, write "*does not exist*" or "*undefined.*"

1.

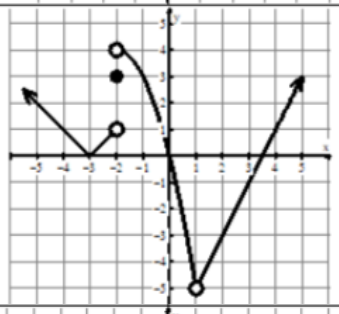


a. $\lim_{x\to -1^-} f(x) =$ 3 b. $f(1) =$ 1 c. $\lim_{x\to 0} f(x) =$ 0

d. $\lim_{x\to 2^+} f(x) =$ 1 e. $f(-1) =$ 1 f. $f(2) =$ DNE

g. $\lim_{x\to -1^+} f(x) =$ 1 h. $\lim_{x\to 1^-} f(x) =$ -1 i. $\lim_{x\to 2} f(x) =$ DNE

2.

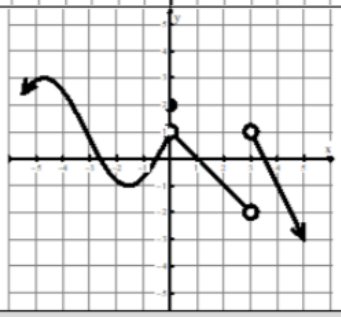


a. $\lim_{x\to -3} f(x) =$ 0 b. $f(1) =$ DNE c. $\lim_{x\to 1} f(x) =$ -5

d. $\lim_{x\to -2^+} f(x) =$ 4 e. $f(3) =$ -1 f. $\lim_{x\to -2^-} f(x) =$ 1

g. $\lim_{x\to -2} f(x) =$ DNE h. $f(-2) =$ 3 i. $f(4) =$ 1

3.



a. $\lim_{x\to 3^+} f(x) =$ 1 b. $f(3) =$ DNE c. $\lim_{x\to 0} f(x) =$ 1

d. $\lim_{x\to 3} f(x) =$ DNE e. $f(0) =$ 2 f. $\lim_{x\to 3^-} f(x) =$ -2

g. $\lim_{x\to 0^+} f(x) =$ 1 h. $f(1) =$ 0

4. Sketch a graph of a function f that satisfies all of the following conditions.

a. $f(-2) = 5$

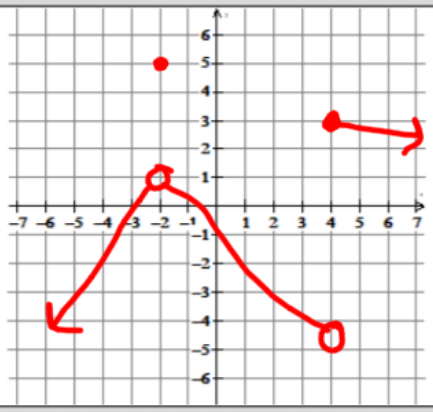
b. $\lim_{x\to -2} f(x) = 1$

c. $\lim_{x\to 4^+} f(x) = 3$

d. f is increasing on $x < -2$

e. $\lim_{x\to 4^-} f(x) < \lim_{x\to 4^+} f(x)$

One possible graph. Make sure all conditions are met for your graph



5. Sketch a graph of a function g that satisfies all of the following conditions.

a. $g(1) = 3$

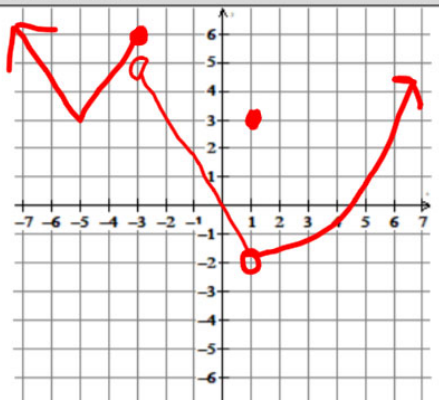
b. $\lim_{x\to 1} g(x) = -2$

c. $\lim_{x\to -3^+} g(x) = 5$

d. g is increasing only on $-5 < x < -3$ and $x > 1$

e. $\lim_{x\to -3^-} g(x) > \lim_{x\to -3^+} g(x)$

One possible graph. Make sure all conditions are met for your graph



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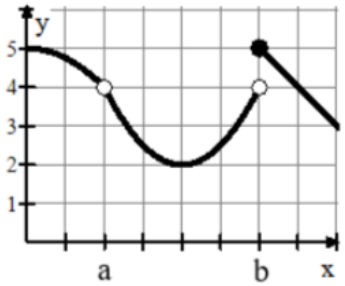
Test Prep

6. The graph of the function f is shown. Which of the following statements about f is true?



(A) $\lim_{x\to a} f(x) = \lim_{x\to b} f(x)$

(B) $\lim_{x\to a} f(x) = 4$

(C) $\lim_{x\to b} f(x) = 4$

(D) $\lim_{x\to b} f(x) = 5$

(E) $\lim_{x\to a} f(x)$ does not exist.

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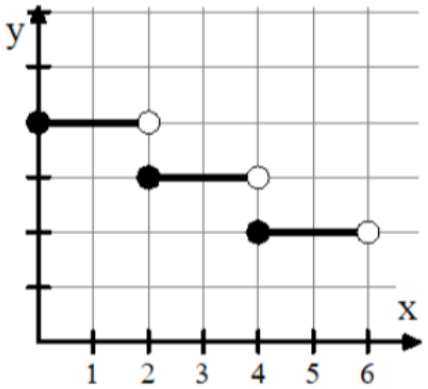
7. The figure below shows the graph of a function f with domain $0 \le x < 6$. Which of the following statements are true?

I. $\lim_{x\to 4^-} f(x)$ exists.

II. $\lim_{x\to 4^+} f(x)$ exists.

III. $\lim_{x\to 4} f(x)$ exists.



(A) I only (B) II only (C) I and II only (D) I and III only (E) I, II, and III

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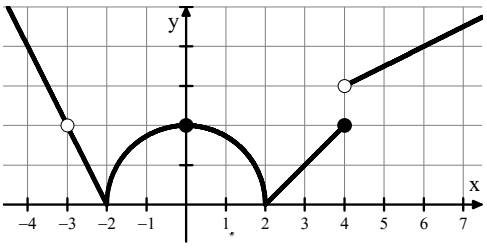
8. The graph of a function f is shown below. For which of the following values of c does $\lim_{x\to c} f(x) = 2$?



(A) 0 only

(B) 0 and 4 only

(C) -3 and 0 only

(D) -3 and 4 only

(E) $-3, 0$, and 4