

1.1 Limits Graphically

Calculus

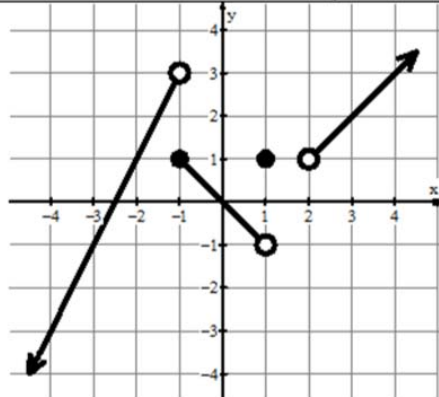
Name: **Solutions**

Practice

For 1-5, give the value of each statement. If the value does not exist, write "does not exist" or "undefined."

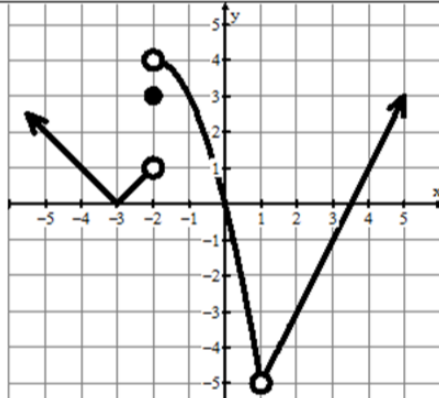
1.

- a. $\lim_{x \rightarrow -1^-} f(x) = 3$ b. $f(1) = 1$ c. $\lim_{x \rightarrow 0} f(x) = 0$
 d. $\lim_{x \rightarrow 2^+} f(x) = 1$ e. $f(-1) = 1$ f. $f(2) = \text{DNE}$
 g. $\lim_{x \rightarrow -1^+} f(x) = 1$ h. $\lim_{x \rightarrow 1^-} f(x) = -1$ i. $\lim_{x \rightarrow 2} f(x) = \text{DNE}$



2.

- a. $\lim_{x \rightarrow 3} f(x) = 0$ b. $f(1) = \text{DNE}$ c. $\lim_{x \rightarrow 1} f(x) = -5$
 d. $\lim_{x \rightarrow -2^+} f(x) = 4$ e. $f(3) = -1$ f. $\lim_{x \rightarrow -2^-} f(x) = 1$
 g. $\lim_{x \rightarrow -2} f(x) = \text{DNE}$ h. $f(-2) = 3$ i. $f(4) = 1$



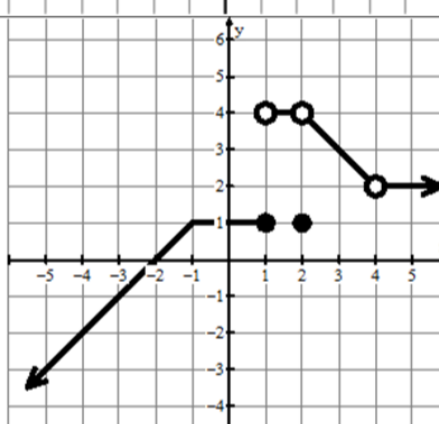
3.

- a. $\lim_{x \rightarrow 3^+} f(x) = 1$ b. $f(3) = \text{DNE}$ c. $\lim_{x \rightarrow 0} f(x) = 1$
 d. $\lim_{x \rightarrow 3} f(x) = \text{DNE}$ e. $f(0) = 2$ f. $\lim_{x \rightarrow 3^-} f(x) = -2$
 g. $\lim_{x \rightarrow 0^+} f(x) = 1$ h. $f(1) = 0$ i. $f(-1.6) = -1$

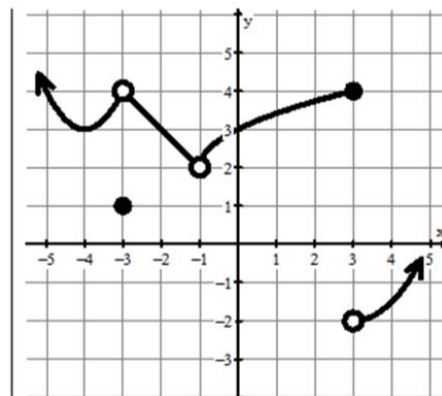


4.

- a. $\lim_{x \rightarrow -1^-} f(x) = 1$ b. $f(2) = 1$ c. $\lim_{x \rightarrow 2} f(x) = 4$
 d. $\lim_{x \rightarrow -1} f(x) = 1$ e. $f(4) = \text{DNE}$ f. $\lim_{x \rightarrow 1^-} f(x) = 1$
 g. $\lim_{x \rightarrow -1^+} f(x) = 1$ h. $f(1) = 1$ i. $\lim_{x \rightarrow 4} f(x) = 2$



- 5.
- a. $\lim_{x \rightarrow 3^-} f(x) = 4$ b. $f(-1) = \text{DNE}$ c. $\lim_{x \rightarrow 3} f(x) = 4$
- d. $\lim_{x \rightarrow -1} f(x) = 2$ e. $f(-3) = 1$ f. $\lim_{x \rightarrow 3^+} f(x) = -2$
- g. $f(3) = 4$ h. $\lim_{x \rightarrow 0} f(x) = 3$ i. $f(-4) = 3$



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

a. $f(-2) = 5$

One possible graph:

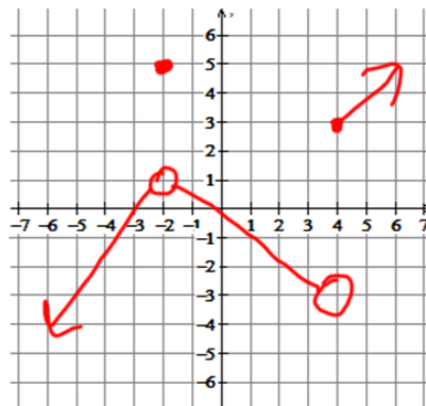
b. $\lim_{x \rightarrow -2} f(x) = 1$

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

All conditions must be met and the graph must be a function (passes the vertical line test).

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

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



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

a. $g(1) = 3$

One possible graph:

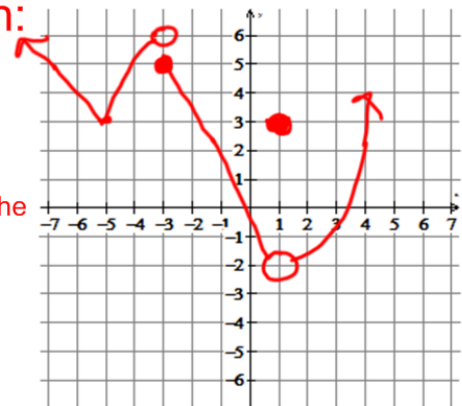
b. $\lim_{x \rightarrow 1} g(x) = -2$

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

All conditions must be met and the graph must be a function (passes the vertical line test).

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

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



8. Sketch a graph of a function h that satisfies all of the following conditions.

a. $\lim_{x \rightarrow 3} h(x) = h(-2) = 1$

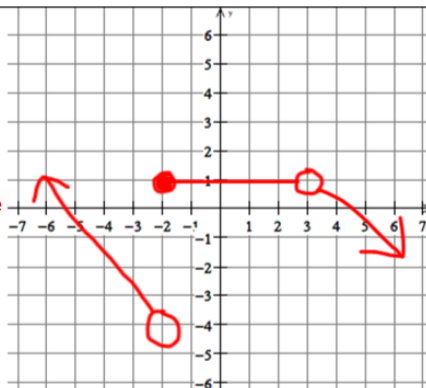
One possible graph:

b. $h(3)$ is undefined.

All conditions must be met and the graph must be a function (passes the vertical line test).

c. $\lim_{x \rightarrow -2^-} h(x) < \lim_{x \rightarrow -2^+} h(x)$

d. h is constant on $-2 < x < 3$ and decreasing everywhere else.



Test Prep: 1. B; 2. C; 3. A; 4. E