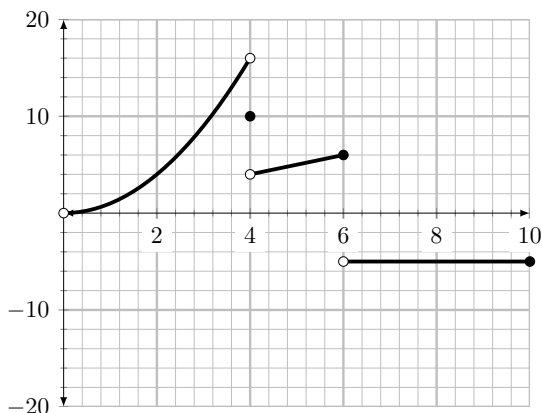


# Solutions

## WORKSHEET: SECTION 2.2 (THE LIMIT OF A FUNCTION)

1. The function  $f(x)$  is graphed below. Use the graph to fill in the blanks. If the limit does not exist, write DNE.



(a)  $\lim_{x \rightarrow 4^-} f(x) = 16$

(b)  $\lim_{x \rightarrow 4^+} f(x) = 4$

(c)  $\lim_{x \rightarrow 4} f(x) = \text{DNE}$

(d)  $f(4) = 10$

(e)  $\lim_{x \rightarrow 6^-} f(x) = 6$

(f)  $\lim_{x \rightarrow 6^+} f(x) = -5$

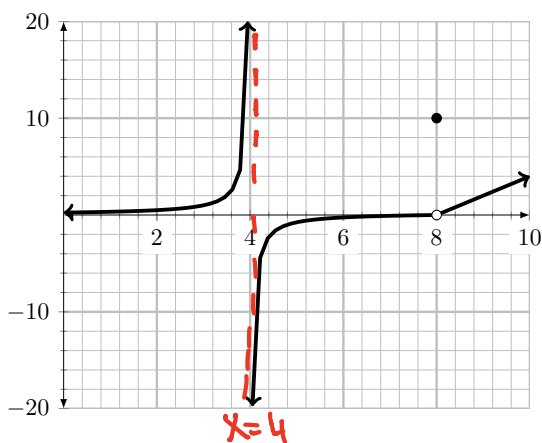
(g)  $\lim_{x \rightarrow 6} f(x) = \text{DNE}$

(h)  $f(6) = 6$

(i)  $\lim_{x \rightarrow 8} f(x) = -5$

(j)  $f(8) = -5$

2. The function  $g(x)$  is graphed below. Use the graph to fill in the blanks.



(a)  $\lim_{x \rightarrow 4^-} g(x) = -\infty$

(b)  $\lim_{x \rightarrow 4^+} g(x) = +\infty$

(c)  $\lim_{x \rightarrow 4} g(x) = \text{DNE}$

(d)  $g(4) = \text{DNE}$

(e)  $\lim_{x \rightarrow 8} g(x) = 10$

(f)  $g(8) = 0$

Write the equation of any vertical asymptotes:

$x = 4$  is a VA

3. Evaluate the limits below by graphing  $f(x) = \begin{cases} x+1 & x < 0 \\ x-1 & 0 \leq x < 2 \\ 1+\sqrt{x-2} & 2 \leq x \end{cases}$

(a)  $\lim_{x \rightarrow 0} f(x) = \text{DNE}$

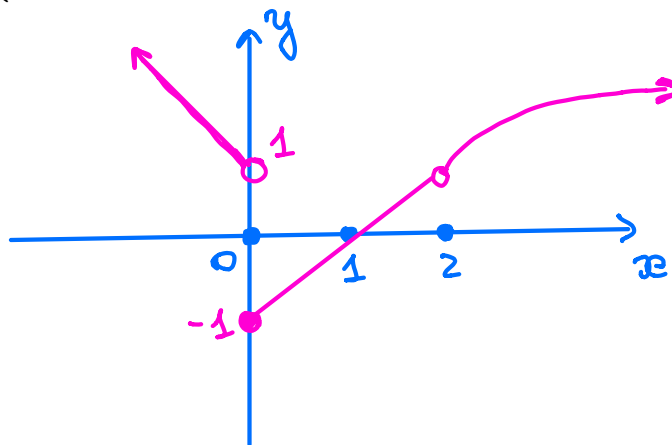
$\lim_{x \rightarrow 0^+} f(x) = -1 \neq \lim_{x \rightarrow 0^-} f(x) = 1$

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

$\lim_{x \rightarrow 2^+} f(x) = \lim_{x \rightarrow 2^-} f(x) = 1$

- (c) For which values  $a$  does  $\lim_{x \rightarrow a} f(x)$  exist?

For all values  $x$  except  $x=0$ .



4. Sketch the graph of an example of a function  $f$  that satisfies *all* of the given conditions.

(a)  $\lim_{x \rightarrow 0} f(x) = 1$

(b)  $\lim_{x \rightarrow 3^-} f(x) = -2$

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

(d)  $f(0) = 2$

(e)  $f(3) = 1$

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

