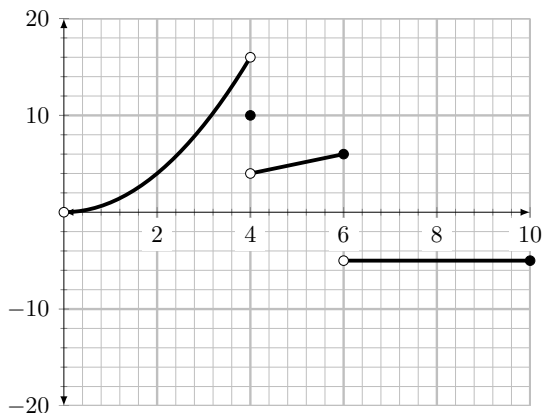# WORKSHEET: SECTION 2.2 (THE LIMIT OF A FUNCTION)

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

(e) $\lim\limits_{x \to 6^-} f(x) = $ _____

(f) $\lim\limits_{x \to 6^+} f(x) = $ _____

(g) $\lim\limits_{x \to 6} f(x) = $ _____

(h) $f(6) = $ _____

(i) $\lim\limits_{x \to 8} f(x) = $ _____

(j) $f(8) = $ _____

(a) $\lim\limits_{x \to 4^-} f(x) = $ _____

(b) $\lim\limits_{x \to 4^+} f(x) = $ _____

(c) $\lim\limits_{x \to 4} f(x) = $ _____

(d) $f(4) = $ _____

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

(a) $\lim\limits_{x \to 4^-} g(x) = $ _____

(b) $\lim\limits_{x \to 4^+} g(x) = $ _____

(c) $\lim\limits_{x \to 4} g(x) = $ _____

(d) $g(4) = $ _____

(e) $\lim\limits_{x \to 8} g(x) = $ _____

(f) $g(8) = $ _____
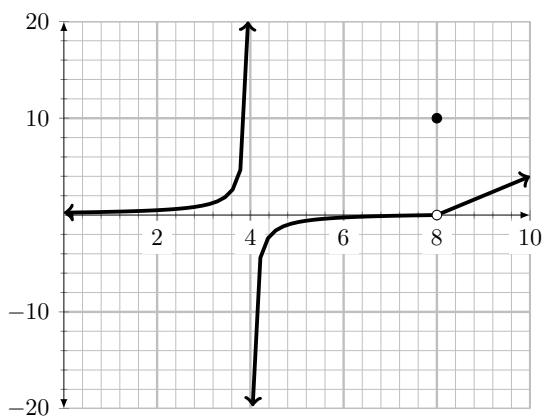
Write the equation of any vertical asymptotes:

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

   (a) $\lim\limits_{x \to 0} f(x)$

   (b) $\lim\limits_{x \to 2} f(x)$

   (c) For which values a does $\lim\limits_{x \to a} f(x)$ exist?

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

   (a) $\lim\limits_{x \to 0} f(x) = 1$

   (b) $\lim\limits_{x \to 3^-} f(x) = -2$

   (c) $\lim\limits_{x \to 3^+} f(x) = 4$

   (d) $f(0) = 2$

   (e) $f(3) = 1$

   (f) $\lim\limits_{x \to -1^+} f(x) = \infty$