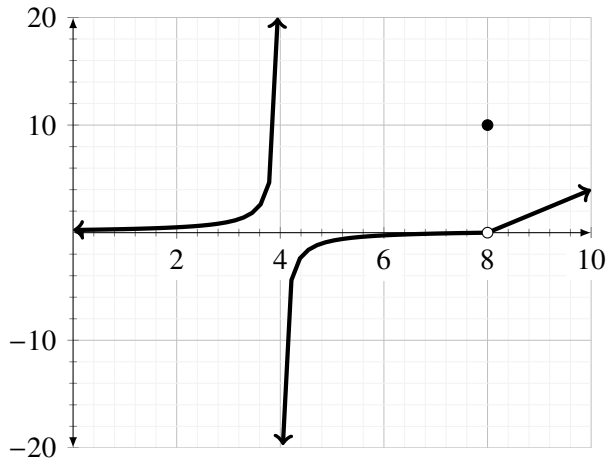
1. The function $g(x)$ is graphed below. Use the graph to fill in the blanks.



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

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

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

d) $g(4) =$ _____

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

f) $g(8) =$ _____

Write the equation of any vertical asymptotes:

2. Graph the function and then evaluate the limits: $f(x) = \begin{cases} x+1 & x < 0 \\ x-1 & 0 \le x < 2 \\ 1+\sqrt{x-2} & 2 < x \end{cases}$

a) $\lim_{x\to 0} f(x)$

b) $\lim_{x\to 2} f(x)$

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

3. Without using a calculator, determine the (infinite) limit. Explain your reasoning.

a) $\lim_{x\to 3^+} \dfrac{\sqrt{x}}{x-3}$

b) $\lim_{x\to 3^+} \dfrac{2-10x}{\sin(x-3)}$

c) $\lim_{x\to 3^+} \ln(x-3)$

4. Sketch the graph of a function f that satisfies *all* of the given conditions. (*Answers will vary.*)

a) $f(0) = 2$

b) $f(3) = 1$

c) $\lim_{x\to 0} f(x) = 1$

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

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

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