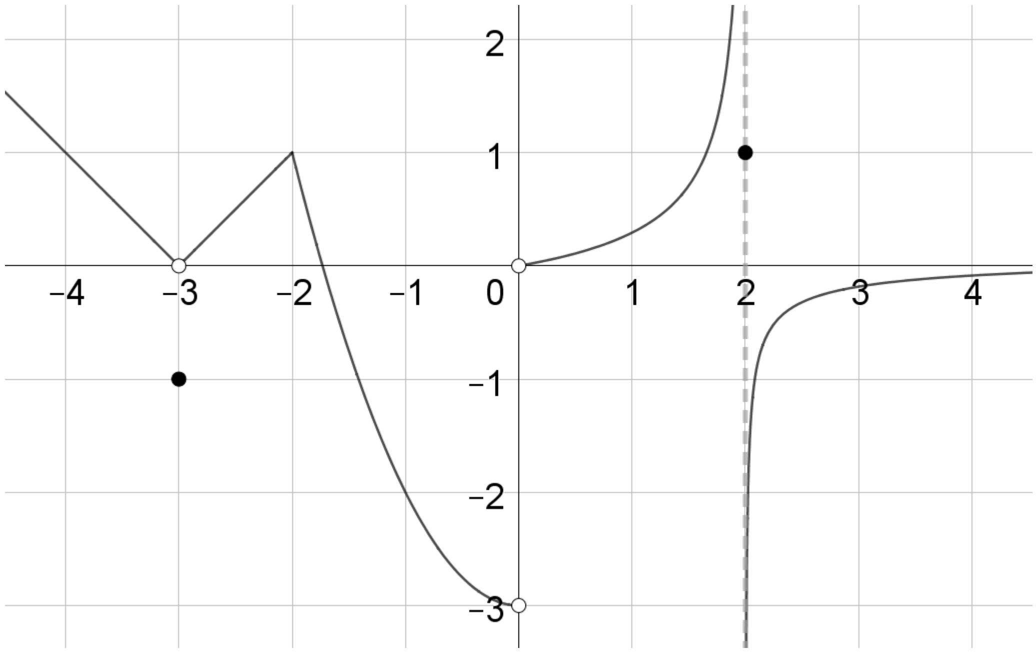
5. Use the graph of the function $f(x)$ below to evaluate the following limits; use the symbols ∞, $-\infty$, or DNE when appropriate:



(a) $\lim_{x \to -3} f(x) =$ 0

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

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

(d) $\lim_{x \to 0^+} f(x) =$ 0

(e) $\lim_{x \to 0} f(x) =$ DNE

(f) $\lim_{x \to 2^+} f(x) =$ $-\infty$

(g) $\lim_{x \to \infty} f(x) =$ 0

Homework 2

7) $\lim_{x \to -\sqrt{3}} \dfrac{8(x^4-9)}{(x^2-3)} = \lim_{x \to -\sqrt{3}} \dfrac{8\cancel{(x^2-3)}(x^2+3)}{\cancel{(x^2-3)}} =$

$\lim_{x \to -\sqrt{3}} 8(x^2+3) = 8((-\sqrt{3})^2+3) = 8(3+3) = 8 \cdot 6 = 48$

11) $\lim_{x \to 1} \sqrt{-5x^2+5x+8} = \sqrt{-5+5+8} = \sqrt{8} = 2\sqrt{2}$

17) $\lim_{x \to -4} f(x) = -5 \qquad \lim_{x \to 0} g(x) = -3$

$\lim_{x \to 0} f(x-4)g(x) = -5 \cdot -3 = 15 \qquad \lim_{x \to 0} f(x-4) \cdot \lim_{x \to 0} g(x)$

$\lim_{x \to -4} f(x) \cdot \lim_{x \to 0} g(x)$

- $\lim_{x \to 0} f(x-4) + g(x) = -5 + -3 = -8 \qquad \lim_{x \to 0} f(x-4) + \lim_{x \to 0} g(x)$

$\lim_{x \to -4} f(x) + \lim_{x \to 0} g(x)$

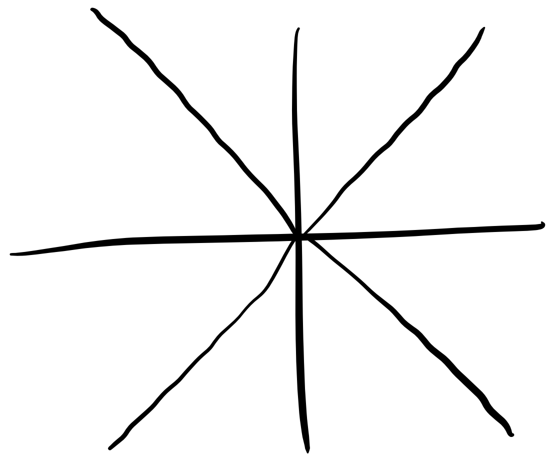
$\lim_{x \to 0} g(x) - f(x-4) = -3 + {}^{-}5 = 2$

$\lim_{x \to -4} \dfrac{f(x)}{g(x+4)} = \dfrac{5}{3}$

$\dfrac{\lim_{x \to -4} f(x)}{\lim_{x \to -4} g(x+4)} = \dfrac{\lim_{x \to -4} f(x)}{\lim_{x \to 0} g(x)} = \dfrac{-5}{-3}$

Squeeze Theorem

$$\lim_{x \to 0} x\sin\left(\frac{1}{x}\right)$$



$$-1 \le \sin\left(\frac{1}{x}\right) \le 1$$

$$\underbrace{-|x|} \le x\sin\left(\frac{1}{x}\right) \le \underbrace{|x|}$$

$$\lim_{x \to 0} -|x| = 0$$

$$\lim_{x \to 0} |x| = 0$$

$$\lim_{x \to 0} x\sin\left(\frac{1}{x}\right) = 0$$