

key

1. Evaluate each expression for the given graph of  $f(x)$ .

(a)  $f(-2) = \text{Undefined}$

(b)  $\lim_{x \rightarrow -2} f(x) = \text{DNE}$

(c)  $f(0) = 4$

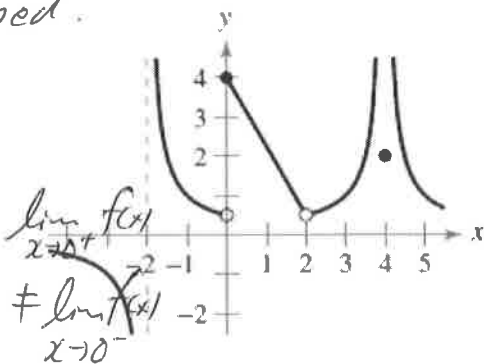
(d)  $\lim_{x \rightarrow 0} f(x) = \text{DNE}$

(e)  $f(2) = \text{undefined}$

(f)  $\lim_{x \rightarrow 2} f(x) = 0.5$

(g)  $f(4) = 2$

(h)  $\lim_{x \rightarrow 4} f(x) = \infty$



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

Evaluate each limit. Show work.

2.  $\lim_{x \rightarrow 6} (x-2)^2 = (6-2)^2 = 16$

3.  $\lim_{t \rightarrow -2} \frac{t+2}{4-t^2} = \lim_{t \rightarrow -2} \frac{(t+2)}{(2-t)(t+2)} = \lim_{t \rightarrow -2} \frac{1}{2-t} = \frac{1}{4}$

4.  $\lim_{x \rightarrow -3} 3|x-1| = 3|-3-1| = 12$

5.  $\lim_{x \rightarrow 4^+} \frac{|4-x|}{4-x} = \lim_{x \rightarrow 4^+} \frac{x-4}{4-x} = -1$

6.  $\lim_{x \rightarrow 4} \frac{(\sqrt{x-3}-1)(\sqrt{x-3}+1)}{x-4} = \lim_{x \rightarrow 4} \frac{(x-3)-1}{(x-4)(\sqrt{x-3}+1)} = \lim_{x \rightarrow 4} \frac{x-4}{(x-4)(\sqrt{x-3}+1)} = \frac{1}{\sqrt{4-3}+1} = \frac{1}{2}$

7.  $\lim_{x \rightarrow \frac{1}{5}} \left( \frac{1-5x}{x-\frac{1}{5}} \right) \cdot 5 = \lim_{x \rightarrow \frac{1}{5}} \frac{5(1-5x)}{5x-1} = -5$

8.  $\lim_{x \rightarrow \infty} \frac{2x}{3x+2} = \frac{2}{3}$

9.  $\lim_{x \rightarrow -\infty} \frac{x}{x+1} = \infty$

10.  $\lim_{x \rightarrow \infty} \frac{x^2}{2x-1} = -\infty$

Work for #8  
H.A:  $y = \frac{2}{3}$

OR  $\lim_{x \rightarrow \infty} \frac{2x(\div x)}{3x+2(\div x)} = \lim_{x \rightarrow \infty} \frac{2}{3+\frac{2}{x}} = \frac{2}{3+\frac{2}{\infty}} = \frac{2}{3}$

11.  $f(x) = \begin{cases} x^2-2, & x < 3 \\ 7-x, & x \geq 3 \end{cases}$

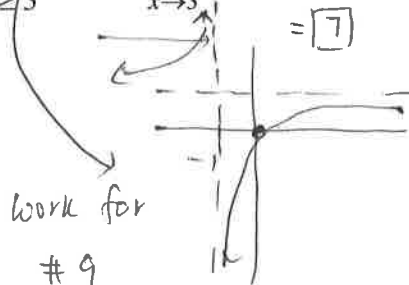
a.  $\lim_{x \rightarrow 3^+} f(x) = 9-2 = 7$

b.  $\lim_{x \rightarrow 3} f(x) = \text{DNE}$

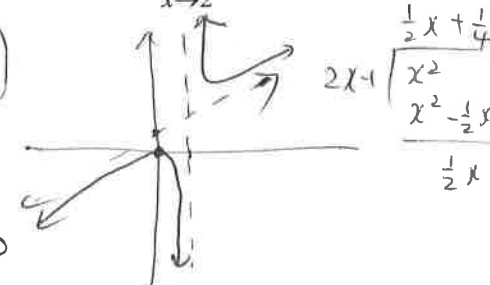
c.  $f(3) = 4$

d.  $\lim_{x \rightarrow 2} f(x) = 4-2 = 2$

$\lim_{x \rightarrow 3^+} 7-3 = 4$



$\lim_{x \rightarrow 3^+} f(x) \neq \lim_{x \rightarrow 3^-} f(x)$



work for #9

work for #10