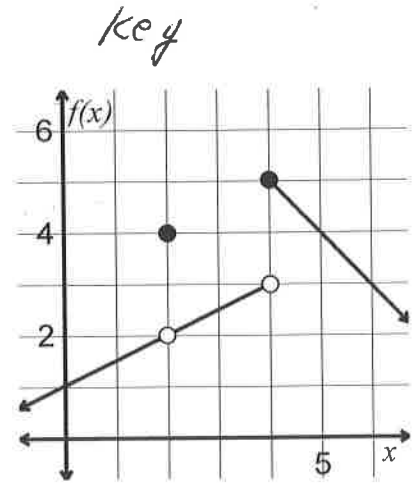


1. Evaluate each expression for the given graph of  $f(x)$ .

- a.  $\lim_{x \rightarrow 2} f(x) = 2$     b.  $\lim_{x \rightarrow 4^-} f(x) = 3$     c.  $f(4) = 5$   
 d.  $\lim_{x \rightarrow 4} f(x) = DNE$     e.  $\lim_{x \rightarrow 2^-} f(x) = 2$     f.  $f(2) = 4$



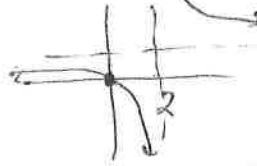
Evaluate each limit. Show work.

2.  $\lim_{x \rightarrow \infty} \frac{1+3x}{2x-9} = \frac{3}{2}$

~~3.  $\lim_{x \rightarrow 0} \frac{7x^2 (1+\cos x)}{(1-\cos x)(1+\cos x)}$~~

4.  $\lim_{x \rightarrow 2^+} \frac{x}{x-2} = +\infty$

H. Asymp:  $y = \frac{3}{2}$



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

$= \lim_{x \rightarrow 1^+} \frac{-(1-x)}{1-x} = \boxed{-1}$

6.  $\lim_{x \rightarrow 4} \frac{\sqrt{x+3} - \sqrt{7}}{x-4}$

$= \lim_{x \rightarrow 4} \frac{(\sqrt{x+3} - \sqrt{7})(\sqrt{x+3} + \sqrt{7})}{(x-4)(\sqrt{x+3} + \sqrt{7})}$

$= \lim_{x \rightarrow 4} \frac{x+3-7}{(x-4)(\sqrt{x+3} + \sqrt{7})} = \lim_{x \rightarrow 4} \frac{1}{(\sqrt{7} + \sqrt{7})} = \frac{1}{2\sqrt{7}} = \boxed{\frac{1}{2\sqrt{7}}}$

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

8.  $f(x) = \begin{cases} x^2 + 2, & x < 2 \\ 5 - x, & x \geq 2 \end{cases}$

a.  $\lim_{x \rightarrow 2^-} f(x)$

$= \lim_{x \rightarrow 2^-} (x^2 + 2)$   
 $= 2^2 + 2 = \boxed{6}$

b.  $\lim_{x \rightarrow 2^+} f(x)$

$= DNE$   
 $\left( \lim_{x \rightarrow 2^+} (5-x) \right)$   
 $= 5 - 2 = \boxed{3}$

c.  $f(2)$

$= 5 - 2 = \boxed{3}$

OR  $= \left( \frac{\sqrt{7}}{14} \right)$

Left limit and Right limit do not match.