Key

**Ch. 1.2-1.3 Limits Quiz Review Worksheet**

1) Find the values

a. $\lim_{x\to -7} g(x) =$ DNE $(+\infty)$

b. $g(-7) =$ 5

c. $\lim_{x\to -4} g(x) =$ DNE

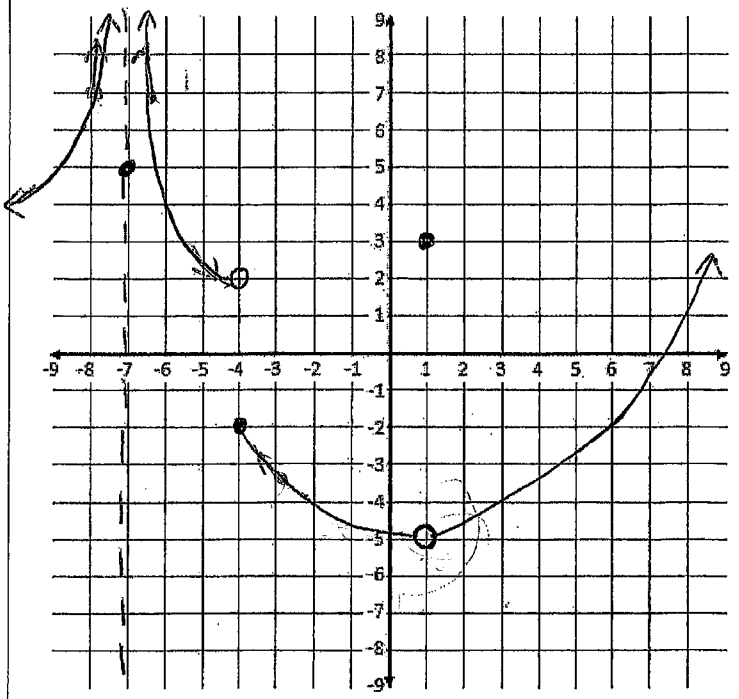
d. $g(-4) =$ $-2$

e. $\lim_{x\to 1} g(x) =$ $-5$

f. $g(1) =$ 3

g. $g(6) =$ $-2$

h. $\lim_{x\to 6} g(x) =$ $-2$



2) Sketch a graph with the following characteristics:

a) $\lim_{x\to -5} f(x) = -3$

b) $g(-5) = undefined$

c) $g(-2) = -1$

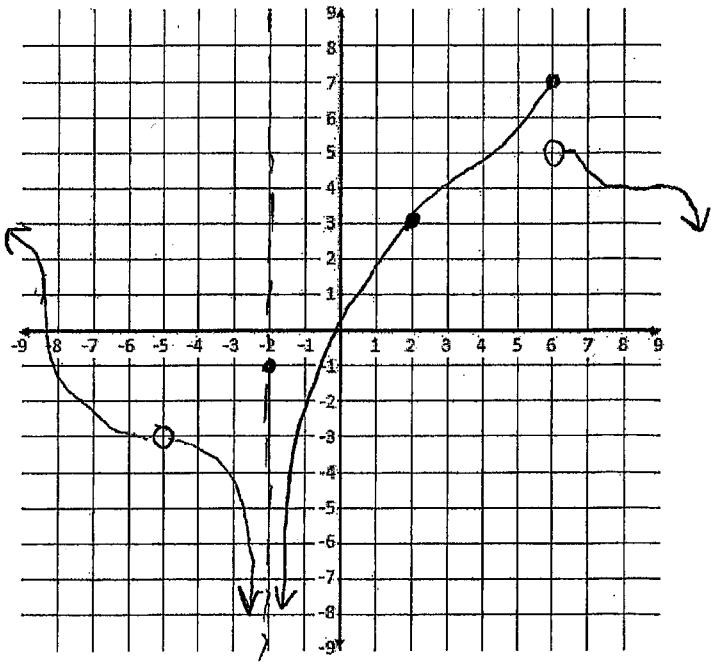
d) $\lim_{x\to -2} f(x) = -\infty$

e) $g(2) = 3$

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

g) $g(6) = 7$

h) $\lim_{x\to 6} f(x)$ *does not exist*



**Evaluate the Limit:**

3) $\lim_{x\to 0} \dfrac{\frac{1}{x+5}-\frac{1}{5}}{x}$ → $\frac{0}{0}$

$\frac{1}{x+5}\cdot\frac{(5)}{(5)} - \frac{1}{5}\cdot\frac{(x+5)}{(x+5)}$

$\frac{5}{5(x+5)} - \frac{(x+5)}{5(x+5)}$

$\frac{5-x-5}{5(x+5)}$

$\frac{-x}{5(x+5)}$

$\frac{-x}{5(x+5)}\cdot\frac{1}{x}$

$\lim_{x\to 0} \frac{-1}{5(x+5)} \to \frac{-1}{5(0+5)}$

$\boxed{\frac{-1}{25}}$

4) $\lim_{x\to 1} \dfrac{x^2-x-2}{x-1}$ → $\frac{1^2-1-2}{1-1} \to \frac{-2}{0}$ V.A.

$\boxed{\text{dne}}$

limit does not exist

5) $\lim_{x\to 2} \dfrac{4-\sqrt{18-x}}{x-2}$ → $\frac{0}{0}$

$\lim_{x\to 2} \frac{4-\sqrt{18-x}}{x-2}\cdot\frac{(4+\sqrt{18-x})}{(4+\sqrt{18-x})} \to \frac{16-(18-x)}{(x-2)(4+\sqrt{18-x})}$

$16-18+x$

$\lim_{x\to 2} \frac{(-2+x)\,1}{(x-2)(4+\sqrt{18-x})} \to \lim_{x\to 2} \frac{1}{4+\sqrt{18-x}} \to \frac{1}{4+\sqrt{16}}$

$= \boxed{\frac{1}{8}}$

6) $\lim_{x\to 1} \dfrac{3x^2-x-2}{x-2}$ → $\frac{3-1-2}{1-2} \to \frac{0}{-1} = \boxed{0}$

7) $\lim_{x\to 5} \dfrac{4x^2-22x+10}{x-5}$ → $\frac{0}{0}$

$-10 \cdot 10 \cdot -1$, $2 \cdot -11 \cdot 2$

$\lim_{x\to 5} \frac{2(2x^2-11x+5)}{x-5} \to \frac{2(x-5)(x-\frac{1}{2})}{x-5}$

$\lim_{x\to 5} \frac{2(x-5)(2x-1)}{(x-5)} \to \lim_{x\to 5} \frac{2(2x-1)}{1} \to 2(9)$

$= \boxed{18}$

8) $\lim_{x\to 0} \dfrac{\sqrt{3+x}-\sqrt{3}}{x}$ → %

$\frac{(\sqrt{3+x}+\sqrt{3})}{(\sqrt{3+x}+\sqrt{3})}$

$\lim_{x\to 0} \frac{3+x-3}{x(\sqrt{3+x}+\sqrt{3})}$

$\lim_{x\to 0} \frac{x}{x(\sqrt{3+x}+\sqrt{3})}$

$\lim_{x\to 0} \frac{1}{\sqrt{3+x}+\sqrt{3}}$

$\frac{1}{\sqrt{3+0}+\sqrt{3}} = \frac{1}{\sqrt{3}+\sqrt{3}} = \boxed{\frac{1}{2\sqrt{3}}}$

9) $\lim_{x\to 0} \dfrac{\frac{1}{4-x}-\frac{1}{4}}{x}$ → %

(4) $\frac{1}{4-x}\cdot\frac{(4-x)}{(4-x)} - \frac{1}{4}\cdot\frac{(4-x)}{(4-x)}$

$\frac{4}{4(4-x)} - \frac{(4-x)}{4(4-x)}$

$\frac{4-4+x}{4(4-x)}$

$\lim_{x\to 0} \frac{x}{4(4-x)}\cdot\frac{1}{x}$

$\lim_{x\to 0} \frac{x}{4(4-x)}\cdot\frac{1}{x}$

$\lim_{x\to 0} \frac{1}{4(4-x)} \to \frac{1}{4(4-0)} = \boxed{\frac{1}{16}}$

10) $\lim_{x\to 1} \dfrac{\frac{3}{x}-3}{x-1}$ → %

$\frac{3}{x} - \frac{3}{1}\cdot\frac{(x)}{(x)}$

$\frac{3}{x} - \frac{3x}{x}$

$\frac{3-3x}{x}$

$\lim_{x\to 1} \frac{3-3x}{x}\cdot\frac{1}{x-1}$

$\lim_{x\to 1} \frac{3-3x}{x}\cdot\frac{1}{x-1}$

$\lim_{x\to 1} \frac{-3(x-1)}{x}\cdot\frac{1}{x-1}$

$\lim_{x\to 1} \frac{-3}{x} \to \frac{-3}{1} = \boxed{-3}$