

Ch. 1.2-1.3 Limits Quiz Review Worksheet #3 Morning Review

1) Find the values

a.  $\lim_{x \rightarrow -8} g(x) =$

b.  $g(-8) =$

c.  $\lim_{x \rightarrow -5} g(x) =$

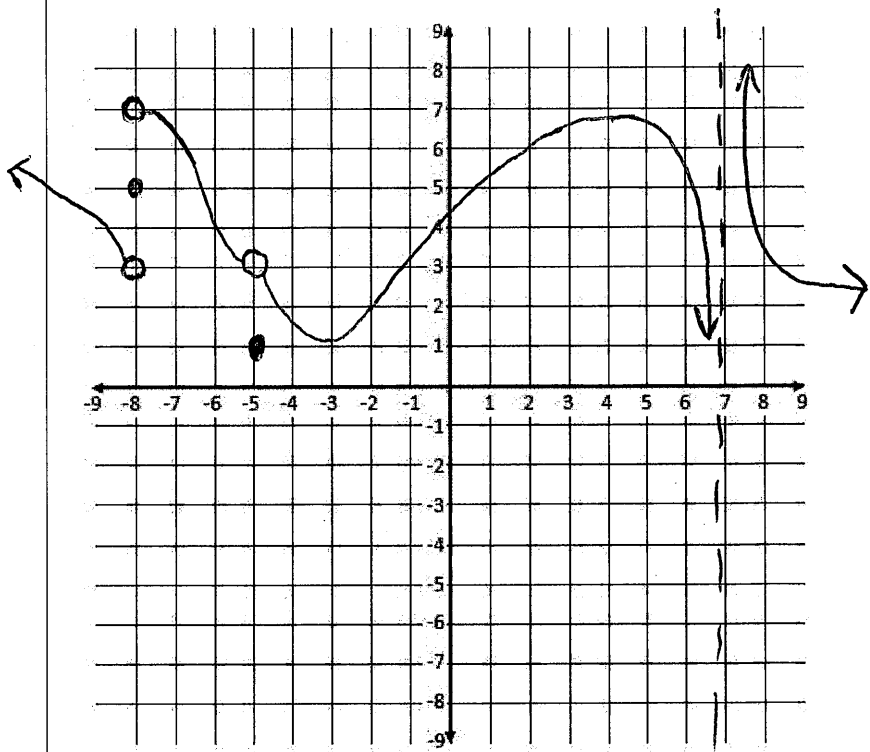
d.  $g(-5) =$

e.  $\lim_{x \rightarrow 2} g(x) =$

f.  $g(2) =$

g.  $g(7) =$

h.  $\lim_{x \rightarrow 7} g(x) =$



2) Sketch a graph with the following characteristics:

a)  $\lim_{x \rightarrow -5} f(x) = \text{does not exist}$

b)  $g(-6) = 2$

c)  $g(-2) = -4$

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

e)  $g(3) = 7$

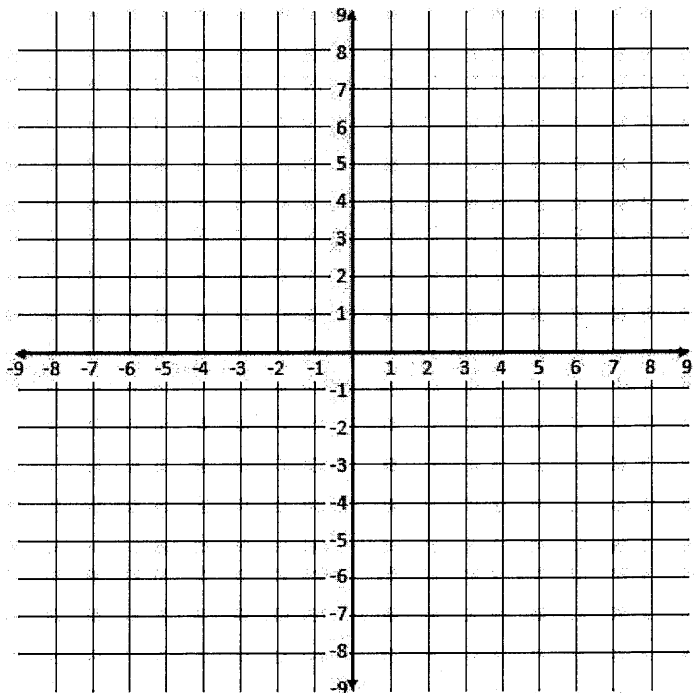
f)  $\lim_{x \rightarrow 2} f(x) = \text{does not exist}$

g)  $g(5) = 4$

h)  $\lim_{x \rightarrow 5} f(x) = -1$

i)  $g(7) = -5$

j)  $\lim_{x \rightarrow 7} f(x) = -5$



Evaluate the Limit:

3)

$$\lim_{x \rightarrow 0} \frac{\frac{1}{x+11} - \frac{1}{11}}{x}$$

4)

$$\lim_{x \rightarrow 0} \frac{2x^2 + 2x - 3}{x - 1}$$

5)

$$\lim_{x \rightarrow 5} \frac{6 - \sqrt{31 + x}}{x - 5}$$

6)

$$\lim_{x \rightarrow -2} \frac{12x^2 + 21x - 6}{x + 2}$$

7)

$$\lim_{x \rightarrow 1} \frac{6x^2 - 15x + 9}{x - 5}$$

8)

$$\lim_{x \rightarrow 0} \frac{\sqrt{13 + x} - \sqrt{13}}{x}$$

9)

$$\lim_{x \rightarrow 2} \frac{\frac{1}{8-x} - \frac{1}{6}}{x - 2}$$

10)

$$\lim_{x \rightarrow 4} \frac{\frac{24}{x} - 1}{x - 4}$$

Key

1) Find the values

a.  $\lim_{x \rightarrow -8} g(x) = \text{DNE}$

b.  $g(-8) = 5$

c.  $\lim_{x \rightarrow -5} g(x) = 3$

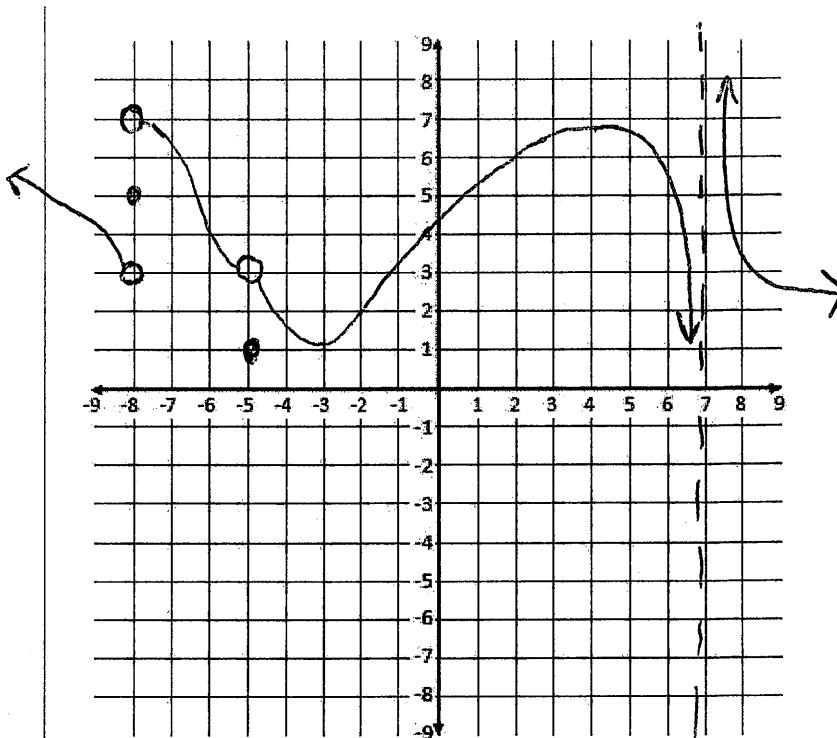
d.  $g(-5) = 1$

e.  $\lim_{x \rightarrow 2} g(x) = 6$

f.  $g(2) = 6$

g.  $g(7) = \text{DNE}$

h.  $\lim_{x \rightarrow 7} g(x) = \text{DNE}$



2) Sketch a graph with the following characteristics:

a)  $\lim_{x \rightarrow -5} f(x) = \text{does not exist} \checkmark$

b)  $g(-6) = 2 \checkmark$

c)  $g(-2) = -4 \checkmark$

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

e)  $g(3) = 7 \checkmark$

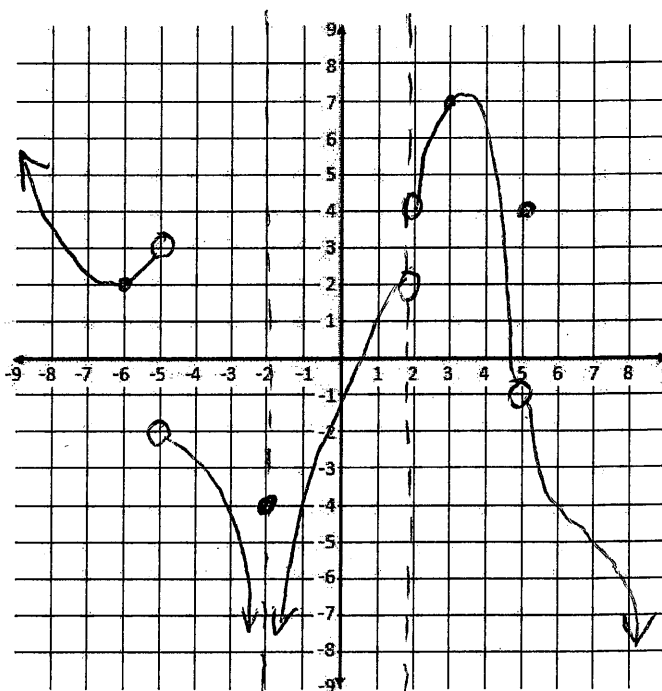
f)  $\lim_{x \rightarrow 2} f(x) = \text{does not exist} \checkmark$

g)  $g(5) = 4 \checkmark$

h)  $\lim_{x \rightarrow 5} f(x) = -1 \checkmark$

i)  $g(7) = -5 \checkmark$

j)  $\lim_{x \rightarrow 7} f(x) = -5 \checkmark$



Evaluate the Limit:

3)

$$\lim_{x \rightarrow 0} \frac{1}{x+11} - \frac{1}{11}$$

$$\frac{0}{0} = \frac{11(x+11)}{1}$$

$$\lim_{x \rightarrow 0} \frac{11 - (x+11)}{11x(x+11)} \quad \left| \quad \lim_{x \rightarrow 0} \frac{-1}{11(x+11)} \right.$$

$$\lim_{x \rightarrow 0} \frac{-x}{11x(x+11)} = \frac{-1}{11(11)} = \boxed{\frac{-1}{121}}$$

4)

$$\lim_{x \rightarrow 0} \frac{2x^2 + 2x - 3}{x - 1}$$

$$\frac{2+2-3}{0-1} = \frac{4-3}{-1}$$

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

5)

$$\frac{0}{0} \lim_{x \rightarrow 5} \frac{6 - \sqrt{31+x}}{x-5} = \frac{6 + \sqrt{31+x}}{6 + \sqrt{31+x}}$$

$$\lim_{x \rightarrow 5} \frac{36 - (31+x)}{(x-5)(6 + \sqrt{31+x})} = \frac{-1}{6 + \sqrt{36}}$$

$$\lim_{x \rightarrow 5} \frac{36 - 31 - x}{(x-5)(6 + \sqrt{31+x})} = \lim_{x \rightarrow 5} \frac{5-x(-1)}{(x-5)(6 + \sqrt{31+x})} = \boxed{\frac{-1}{12}}$$

6)

$$\frac{0}{0} \lim_{x \rightarrow -2} \frac{12x^2 + 21x - 6}{x+2} = \frac{3(4x^2 + 7x - 2)}{x+2}$$

$$\lim_{x \rightarrow -2} \frac{3(4x-1)(x+2)}{(x+2)} = 3[4(-2)-1]$$

$$= 3(-9) = \boxed{-27}$$

7)

$$\lim_{x \rightarrow 1} \frac{6x^2 - 15x + 9}{x-5} = \frac{6-15+9}{1-5}$$

$$= \frac{-9+9}{-4} = \frac{0}{-4} = \boxed{0}$$

8)

$$\frac{0}{0} \lim_{x \rightarrow 0} \frac{\sqrt{13+x} - \sqrt{13}}{x} = \frac{\sqrt{13+x} + \sqrt{13}}{\sqrt{13+x} + \sqrt{13}}$$

$$\lim_{x \rightarrow 0} \frac{13+x-13}{x(\sqrt{13+x} + \sqrt{13})} = \lim_{x \rightarrow 0} \frac{x}{x(\sqrt{13+x} + \sqrt{13})}$$

$$\frac{1}{\sqrt{13} + \sqrt{13}} = \boxed{\frac{1}{2\sqrt{13}}}$$

9)  $\frac{0}{0}$

$$\lim_{x \rightarrow 2} \frac{1}{8-x} - \frac{1}{6} = \frac{6(8-x)}{1}$$

$$6-8+x$$

$$\lim_{x \rightarrow 2} \frac{6 - (8-x)}{(x-2) \cdot 6(8-x)}$$

$$= \lim_{x \rightarrow 2} \frac{(x-2)}{(x-2) \cdot 6(8-x)} = \frac{1}{6(8-2)} = \boxed{\frac{1}{36}}$$

10)

$$\frac{24}{4} - 1 = \lim_{x \rightarrow 4} \frac{x}{x-4}$$

$$\frac{24}{4} - 1 = \frac{6-1}{6-4} = \frac{5}{2}$$

Limit Does Not Exist!