

key

1) Find the values **DNE**

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

b. $g(-8) = \text{undefined}$

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

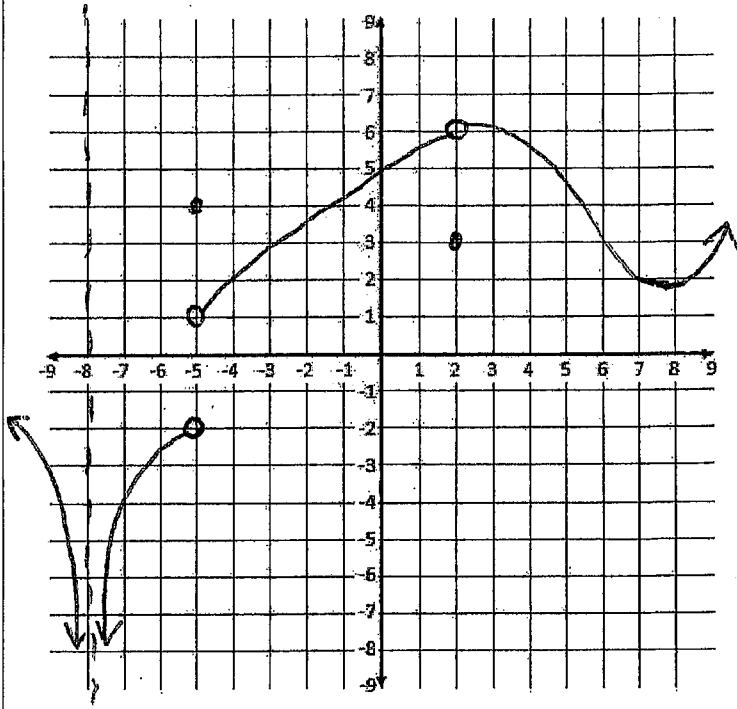
d. $g(-5) = 4$

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

f. $g(2) = 3$

g. $g(7) = 2$

h. $\lim_{x \rightarrow 7} g(x) = 2$



2) Sketch a graph with the following characteristics:

a) $\lim_{x \rightarrow -5} f(x) = -4$

b) $g(-5) = \text{undefined}$

c) $g(-2) = -8$

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

e) $g(2) = 7$

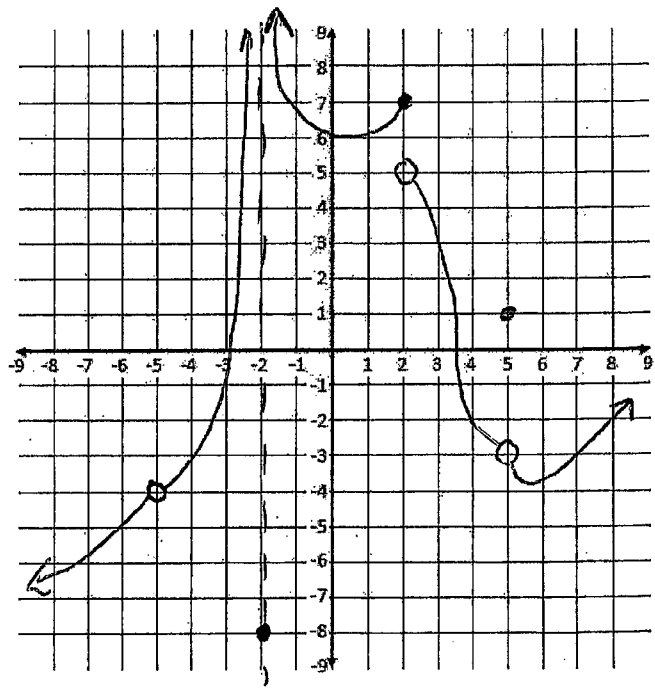
f) $\lim_{x \rightarrow 2} f(x) = \text{does not exist}$

g) $g(5) = 1$

h) $\lim_{x \rightarrow 5} f(x) = -3$

i) $g(7) = -3$

j) $\lim_{x \rightarrow 7} f(x) = -3$



Evaluate the Limit:

3) $\lim_{x \rightarrow 0} \frac{1}{x+6} - \frac{1}{6}$ $\rightarrow \frac{0}{0}$

(6) $\frac{1}{x+6} - \frac{1}{6} = \frac{6 - (x+6)}{6(x+6)}$

$\lim_{x \rightarrow 0} \frac{6-x-6}{6(x+6)} \cdot \frac{1}{x}$

$\lim_{x \rightarrow 0} \frac{-x}{6(x+6)} \cdot \frac{1}{x}$

$\lim_{x \rightarrow 0} \frac{-1}{6(6)} = \frac{-1}{36}$

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

vertical asymptote

d.n.e.

5) $\lim_{x \rightarrow 5} \frac{4 - \sqrt{11+x}}{x-5}$ $\rightarrow \frac{0}{0}$

$\lim_{x \rightarrow 5} \frac{(4 - \sqrt{11+x})(4 + \sqrt{11+x})}{(x-5)(4 + \sqrt{11+x})}$

$\lim_{x \rightarrow 5} \frac{16 - (11+x)}{(x-5)(4 + \sqrt{11+x})}$

$\lim_{x \rightarrow 5} \frac{5-x}{(x-5)(4 + \sqrt{11+x})}$

$\frac{-1}{4 + \sqrt{16}} = \frac{-1}{8}$

6) $\lim_{x \rightarrow 1} \frac{4x^2 - x - 2}{x - 3}$ $\rightarrow \frac{4-1-2}{1-3} = \frac{1}{-2} = \frac{-1}{2}$

7) $\lim_{x \rightarrow 3} \frac{6x^2 - 15x - 9}{x-3}$ $\rightarrow \frac{0}{0}$

$\lim_{x \rightarrow 3} \frac{3(2x^2 - 5x - 3)}{x-3}$

$\lim_{x \rightarrow 3} \frac{3(x-3)(2x+1)}{(x-3)}$

$3(2(3)+1) = 21$

8) $\lim_{x \rightarrow 0} \frac{\sqrt{5+x} - \sqrt{5}}{x}$ $\rightarrow \frac{0}{0}$

$\lim_{x \rightarrow 0} \frac{(\sqrt{5+x} - \sqrt{5})(\sqrt{5+x} + \sqrt{5})}{x(\sqrt{5+x} + \sqrt{5})}$

$\lim_{x \rightarrow 0} \frac{5+x-5}{x(\sqrt{5+x} + \sqrt{5})}$

$\lim_{x \rightarrow 0} \frac{x}{x(\sqrt{5+x} + \sqrt{5})} = \frac{1}{2\sqrt{5}}$

9) $\lim_{x \rightarrow 0} \frac{1}{2-x} - \frac{1}{2}$ $\rightarrow \frac{0}{0}$

(2) $\frac{1}{2-x} - \frac{1}{2} = \frac{2 - (2-x)}{2(2-x)}$

$\lim_{x \rightarrow 0} \frac{2-x-2}{2(2-x)}$

$\lim_{x \rightarrow 0} \frac{-x}{2(2-x)}$

$\lim_{x \rightarrow 0} \frac{-1}{2(2-0)} = \frac{-1}{4}$

10) $\lim_{x \rightarrow 2} \frac{\frac{2}{x} - 1}{x-2}$ $\rightarrow \frac{0}{0}$

$\lim_{x \rightarrow 2} \frac{\frac{2-x}{x}}{x-2} \cdot \frac{1}{x-2}$

$\lim_{x \rightarrow 2} \frac{2-x}{x} \cdot \frac{1}{x-2}$

$\lim_{x \rightarrow 2} \frac{-1(x-2)}{x} \cdot \frac{1}{x-2}$

$\lim_{x \rightarrow 2} \frac{-1}{x} = \frac{-1}{2}$