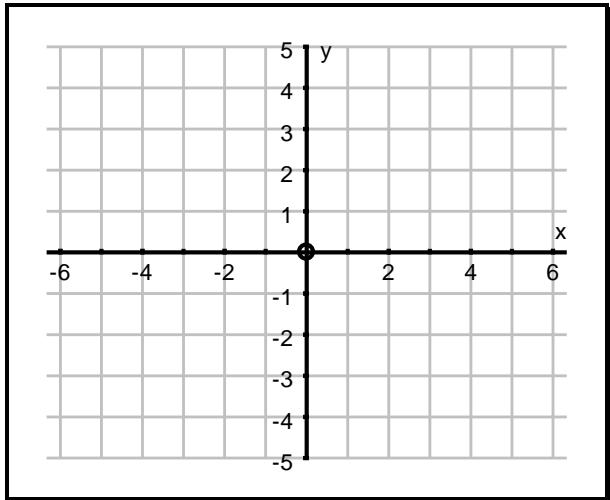


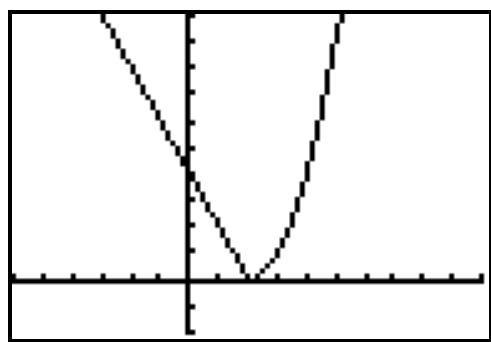
**BOX ALL OF YOUR ANSWERS!**

- 1) Graph and find  $\lim_{x \rightarrow 1} f(x)$ , if  $f(x) = \begin{cases} 4-x, & x < 1 \\ 4-x^2, & x > 1 \end{cases}$



$$\text{Limit} = \underline{\hspace{2cm}}$$

- 2) Use the graph to estimate  $\lim_{x \rightarrow 2} f(x)$   
Scale=1



$$\text{Limit} = \underline{\hspace{2cm}}$$

- 3) Evaluate each of the following limits

$$\lim_{x \rightarrow 2} (-2x^2 - 6x + 1) =$$

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

$$\text{Find } \lim_{x \rightarrow \pi} \tan 5x =$$

$$\lim_{x \rightarrow 3} \frac{x-3}{x^2 - 9} =$$

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

$$\lim_{x \rightarrow -4} \frac{x^2 + 11x + 28}{x + 4} =$$

$$\lim_{x \rightarrow 2} \frac{4 - \sqrt{18-x}}{x-2} =$$

$$\lim_{x \rightarrow 0} \frac{\sqrt{x+4} - 2}{x} =$$

$$\lim_{x \rightarrow c} f(x) = -\frac{1}{2} \text{ and } \lim_{x \rightarrow c} g(x) = \frac{2}{3}, \text{ find } \lim_{x \rightarrow c} \frac{f(x)}{g(x)} =$$

4) Let  $f(x) = \begin{cases} x^2 + 1, & x \leq 0 \\ 2x - 3, & x > 0 \end{cases}$ , Find each limit if it exists

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

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

$$\lim_{x \rightarrow 0} f(x)$$

Limit = \_\_\_\_\_

Limit = \_\_\_\_\_

Limit = \_\_\_\_\_

5) Find  $f'(x)$ , by using the derivative formula, for  $f(x) = -x^2 - x$ , Then use your result to find the slope of the tangent line at  $(0, 0)$  and  $(2, -6)$

6) Evaluate each of the Limits at  $\infty$

$$\lim_{x \rightarrow \infty} \frac{3x+2}{2x-4} =$$

$$\lim_{x \rightarrow \infty} \frac{2x}{(x+4)^2} =$$

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

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

7) Given the  $n^{th}$  term of the sequence, find the limit of the sequence if it exists;  $a_n = \frac{1}{n^2} (n+2)^2$

8) Write the first five terms of the sequence, then find the limit of the sequence if it exists;  $a_n = \frac{n+2}{n^2+4}$

9) Given the  $n^{th}$  term of the sequence, find the limit of the sequence if it exists;  $a_n = \frac{81}{n^4} \left[ \frac{n^2(n+1)^2}{4} \right]$