Name: _____

1. a) Expand $(x + 1)^3$ b) Expand $(x + 1)^6$

c) What is the x^6 term of $(x + 1)^{20}$?

2. What's wrong with this proof?   a) Explain what is happenning on each line of the proof.
                                                b) Explain what went wrong.

$a = b$ Given statement _____

$a - b = 0$ _____

$2a - 2b = 0 \cdot 2$ _____

$2a - 2b = 0$ _____

$2a - 2b = a - b$ _____

$2(a - b) = a - b$ _____

$\dfrac{2(a - b)}{a - b} = \dfrac{a - b}{a - b}$ _____

$2 = 1$ _____

So what went wrong??

3. Solve for x. $\dfrac{1}{x} = 0$

4. Use a calculator to fill in the charts.

a)

1/1 =
1/2 =
1/20 =
1/300 =
1/4000 =
1/50000 =
1/600000 =
1/1000000000 =

b)

1/ 1 =
1/ .5 =
1/ .1 =
1/ .02 =
1/ .001 =
1/ .0003 =
1/ .00005 =
1/ .0000000001 =

What happens in chart (a) as the denominator gets larger and larger?

What happens in chart (b) as the denominator gets smaller and smaller?

5. Graph the function $y = 1/x$ on the graphing calculator. Sketch the graph below.
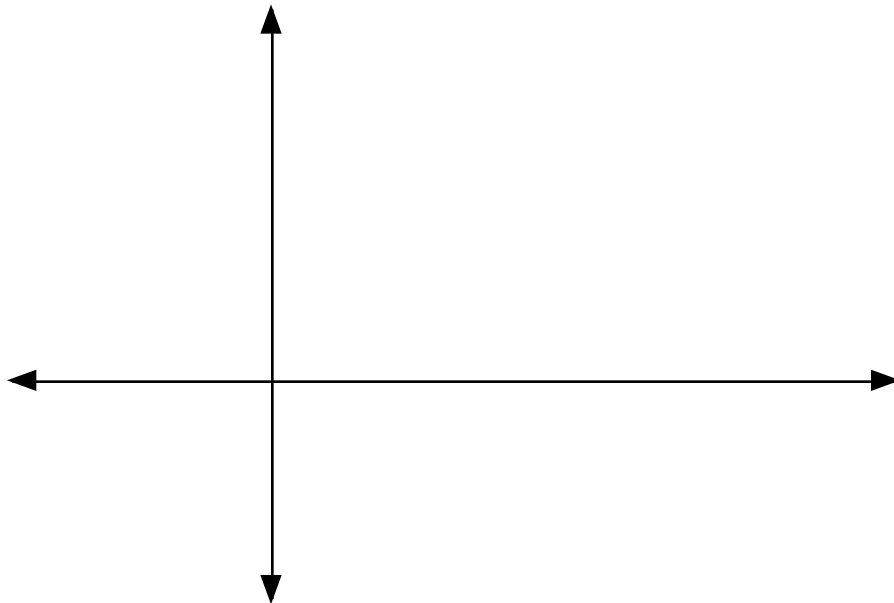
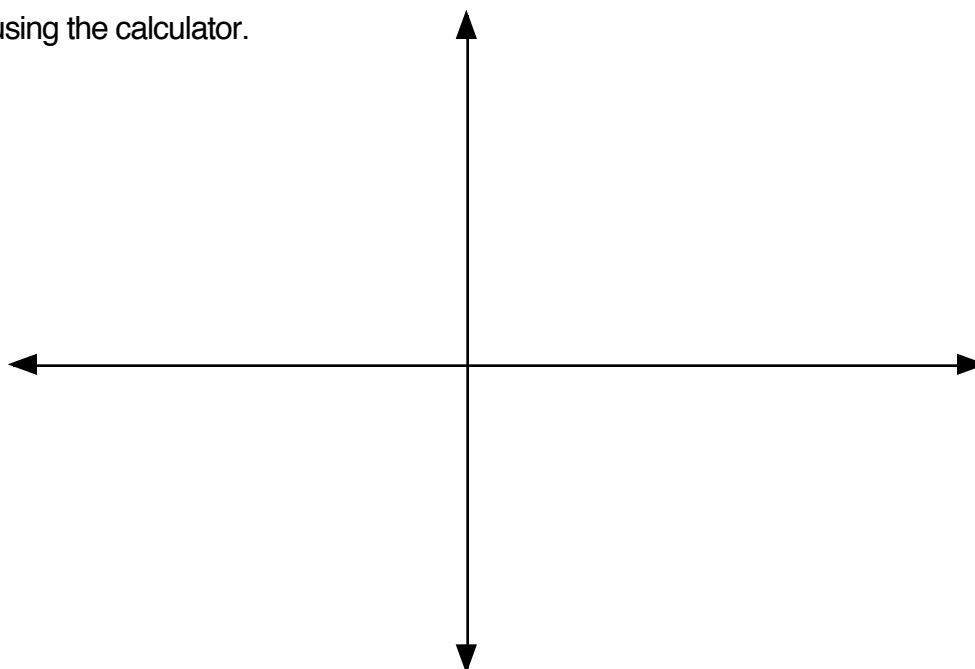We describe this situation mathematically:

Pronounced: "

6. Fill out the chart below for $y = \dfrac{x^2 + 7x + 10}{x + 2}$:

x	y	x	y
-1.8		-2.2	
-1.9		-2.1	
-1.95		-2.05	
-1.99		-2.01	
-1.999		-2.001	
-1.9999		-2.0001	

Predict the value for x = -2.

Graph this function using the calculator.

Find $\displaystyle\lim_{x \to -2} \dfrac{x^2 + 7x + 10}{x + 2}$

7. Find $\displaystyle\lim_{x \to \infty} \sqrt{\dfrac{x^4 - 16}{2x^2 + 5}}$ using the calculator.

Practice Problems

1. a) Find $\lim\limits_{x \to 0} \dfrac{5}{x^2}$

   b) Justify your answer with a graph, calculations near x = 0, and/or a verbal explanation.

   c) Find $\lim\limits_{x \to \infty} \dfrac{5}{x^2}$

   d) Justify your answer with a graph, calculations as x approaches infinity, and/or a verbal explanation.

2. a) Find $\lim\limits_{x \to 4} \dfrac{x^2 - 7x + 12}{x - 4}$

   b) Describe the graph at x = 4

   c) Why can't you just evaluate the original expression at x = 4 to find the limit?

Challenge question:

   a) Find $\lim\limits_{x \to 0} \dfrac{x + 5}{x}$ b) Find $\lim\limits_{x \to \infty} \dfrac{x + 5}{x}$