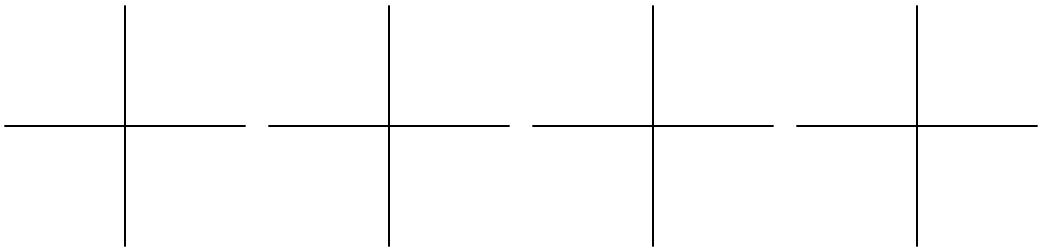
Power functions: End behavior NAME:

We will investigate how we can tell the end behavior of a power function just by looking at its equation. Remember end behavior answers the question, "what is happening to the *y* values as *x* gets really small (left end of graph) and as *x* gets really large (right end of graph)?"

On this worksheet, it is not necessary to get too critical of your graphs; we are particularly interested in the end behavior and not the minute details in between. Graph in the standard window unless specified otherwise.

1. Graph the following functions.

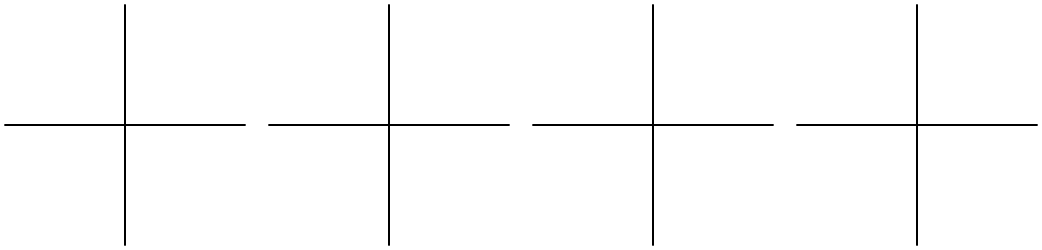
$y = 2x^2$, $y = 5x^4$, $y = \frac{1}{2}x^{22}$, $y = .33x^6$



What is the end behavior of each function above?

2. Graph the following functions.

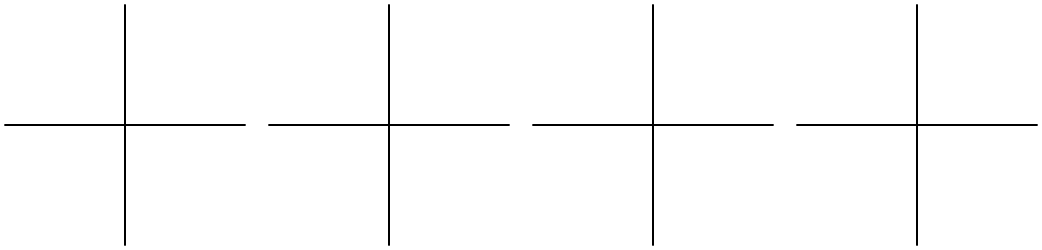
$y = 2x^3$, $y = 5x^7$, $y = \frac{1}{2}x^{19}$, $y = .33x^3$



What is the end behavior of each function above?

3. Graph the following functions.

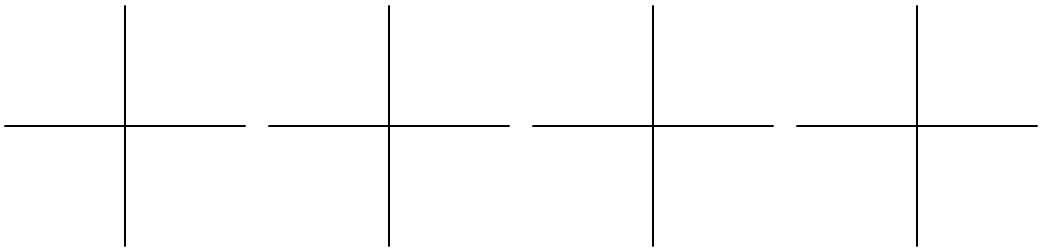
$y = -2x^2$, $y = -5x^4$, $y = -\frac{1}{2}x^{22}$, $y = -.33x^6$



What is the end behavior of each function above?

4. Graph the following functions.

$y = -2x^3$, $y = -5x^7$, $y = -\frac{1}{2}x^{19}$, $y = -.33x^3$



What is the end behavior of each function above?

5. Review the graphs you have made to satisfy yourself that the end behavior of a power function $y = ax^n$ depends on if a is negative or positive and if n is even or odd. Complete the table below by filling in the four possible end behaviors.

	Negative leading coefficient	**Positive leading coefficient**
Odd degree		
Even degree		