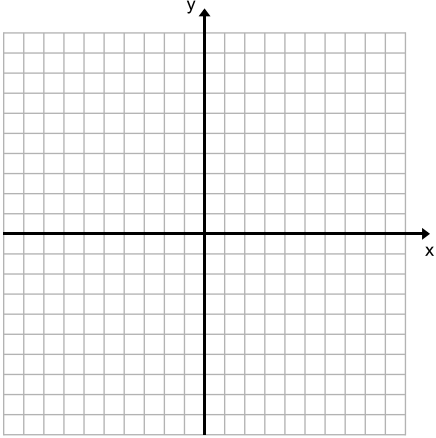
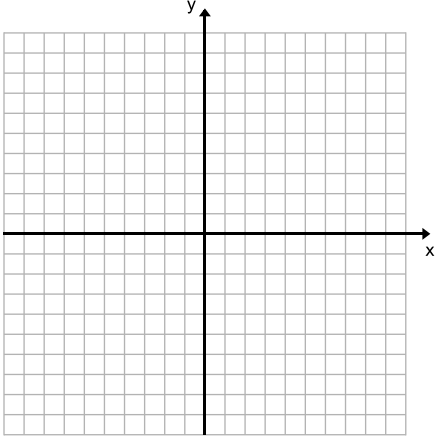


INVESTIGATION: Polynomial Functions of Odd Degree

	GROUP A	GROUP B
	$y = x^3$ $y = x^3 + x^2 - 4x - 4$ $y = x^3 + 5x^2 + 3x - 9$	$y = -x^3$ $y = -x^3 - x^2 + 4x + 4$ $y = -x^3 - 5x^2 - 3x + 9$
		
End Behaviour		
# Local Minimums		
# Local Maximums		
# x-intercepts		

1. Describe the similarities and differences between the two groups of graphs.

2. Which group of graphs is similar to the graph of

a.  $y = x$ ?

b.  $y = -x$ ?

Explain how they are similar.

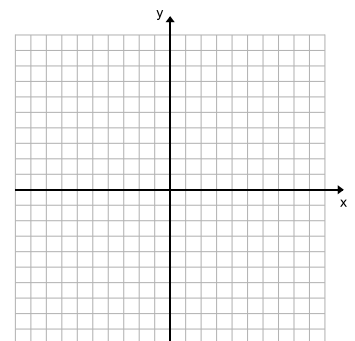
3. Graph each of the following functions using a graphing calculator.

Compare the graphs and describe the similarities and differences.

a.  $y = x^5$

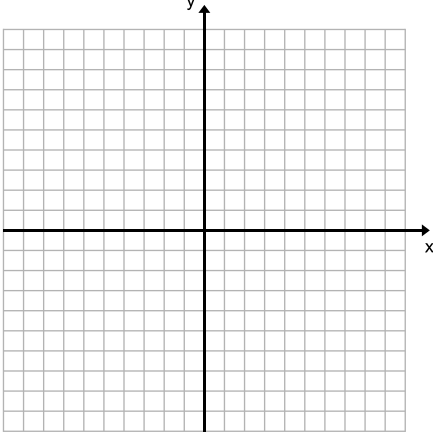
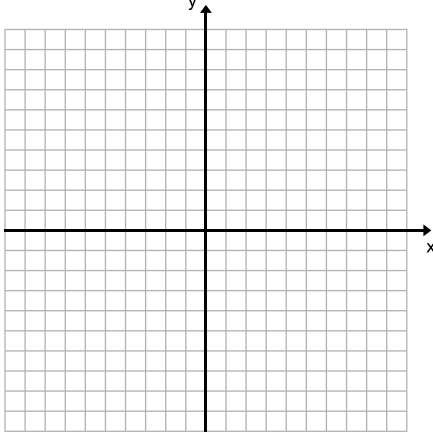
b.  $y = x^5 + 3x^4 - x^3 - 7x^2 + 4$

c.  $y = -x^5 + x^4 + 9x^3 - 13x^2 - 8x + 12$



4. What are the similarities and differences between the graphs of linear, cubic and quintic, functions?
5. What are the minimum and maximum numbers of x-intercepts of graphs of cubic polynomial functions?
6. Describe the relationship between the number of local minimum and maximum points and the degree of a polynomial function?
7. What is the relationship between the sign of the leading coefficient and the end behaviour of graphs of polynomial functions with odd degree?

## INVESTIGATION: Polynomial Functions of Even Degree

	GROUP A	GROUP B
	$y = x^4$ $y = x^4 - x^3 - 6x^2 + 4x + 8$ $y = x^4 - 3x^3 - 3x^2 + 11x - 4$	$y = -x^4$ $y = -x^4 - 5x^3 + 5x + 10$ $y = -x^4 + 3x^3 + 3x^2 - 11x + 4$
		
End Behaviour		
# Local Minimums		
# Local Maximums		
# x-intercepts		

- Describe the similarities and differences between the two groups of graphs.
- Which group of graphs is similar to the graph of
  - $y = x^2$ ?
  - $y = -x^2$ ?
 Explain how they are similar.
- What are the similarities and differences between the graphs of quadratic and quartic functions?
- What are the minimum and maximum numbers of x-intercepts of graphs of quartic polynomial functions?

