Algebra 2 Name:

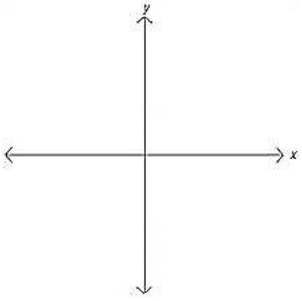
Polynomials in Factored Form Date: Period:

A graphing calculator or graphing app on a mobile device is required.

PART 1 – Factors and Roots

1. Graph $y = (x + 4)(x - 5)(x + 2)$.

Sketch the graph.

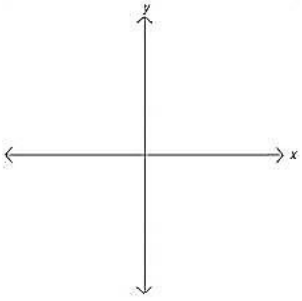


From the graph, what are the roots?

How do these roots relate to the equation above?

2. Graph $y = x(x - 1)(x + 1)(x - 7)$

Sketch the graph.

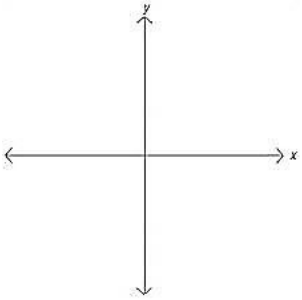


From the graph, what are the roots?

How do these roots relate to the equation above?

3. Graph $y = -4(x - 3)(x - 9)(x + 1)(x + 5)$.

Sketch the graph.



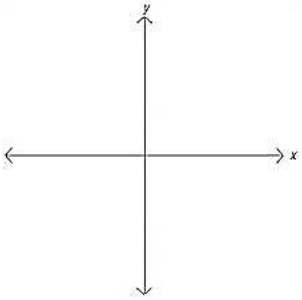
From the graph, what are the roots?

How do these roots relate to the equation above?

How did the -4 affect the graph?

4. Graph $y = \frac{4}{5}x(x + 6)(x + 3)(x - 2)(x - 4)$

Sketch the graph.



From the graph, what are the roots?

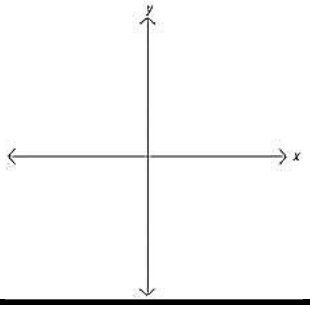
How do these roots relate to the equation above?

How did the $\frac{4}{5}$ affect the graph?

Describe how you can predict what the roots of a polynomial are when given factored form?

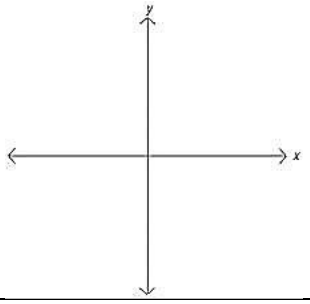
If the roots of a polynomial are *x* = -1, 2, 6, -7, what might the equation be? Is your equation is the ONLY possible answer? If so, how do you know? If not, list another possible equation.

PART 2 – Factors and End Behavior

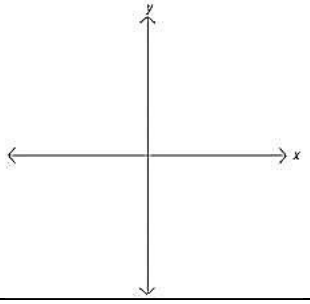
Describe the End Behavior of $y = x^3 - x$.	$y = x^3 - x$ can be written in factored form $y = x(x+1)(x-1)$ Determine the roots.	Plot the roots and end behavior you found. 	Use your graphing calculator to help you complete the graph.

End behavior can be determined from factored form. You only need the degree (highest exponent) and the leading coefficient.
If you consider what these would be IF you expanded factored form, you can get all the information you need for end behavior.

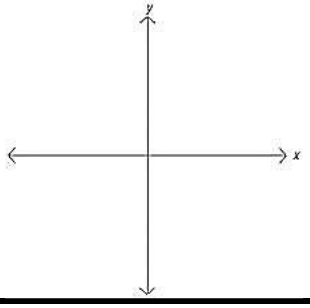
Sketch the graph of $y = (2x-1)(x+4)(x-2)(x+1)$.

Step 1: Determine end behavior. ***IF*** the polynomial above were expanded, what would the degree be? What would the leading coefficient be?	Step 2: Determine the roots. Use factored form.	Step 3: Plot the roots and end behavior you found. 	Step 4: Connect the known elements of the graph with a smooth continuous curve. Be careful not to add additional roots!! Check with your calculator.

Sketch the graph of $y = -3x(x+7)(x-5)$.

Step 1: End Behavior Degree: Leading Coefficient:	Step 2: Roots x =	Step 3: Plot what you know 	Step 4: Sketch the graph.

Sketch the graph of $y = \frac{5}{6}(3x-2)(x-1)(x+9)(2x+5)(x+6)$.

Step 1: End Behavior Degree: Leading Coefficient:	Step 2: Roots x =	Step 3: Plot what you know 	Step 4: Sketch the graph.

Algebra 2 Name:

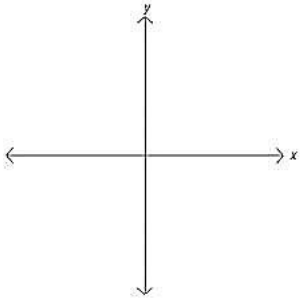
Graphing Polynomials HW #1 Date: Period:

Write a polynomial function with the given zeros.

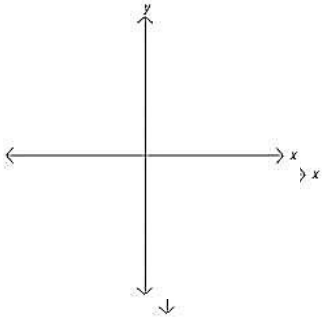
1. 5, -1, 3 **2.** 2, 3, -1, -3 **3.** 0, -8, 2 **4.** -10, 0, 2, 3, -6

For each polynomial function, find the end behavior, leading coefficient, roots, and sketch the graph.

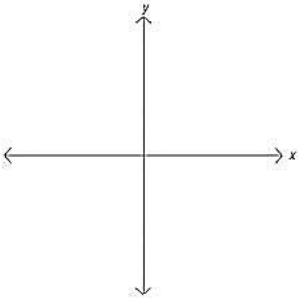
5. $y = x(x+6)(x-2)$



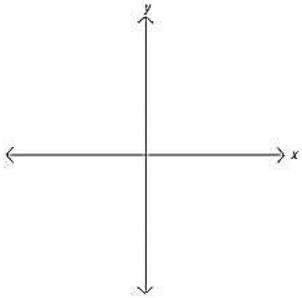
6. $y = 2x(x+2)(x-10)$



7. $y = -2(x-1)(x+1)(x-4)(x+4)$



8. $y = 3x(x+4)(2x-3)$



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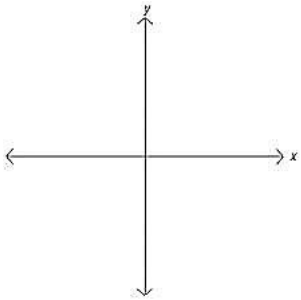
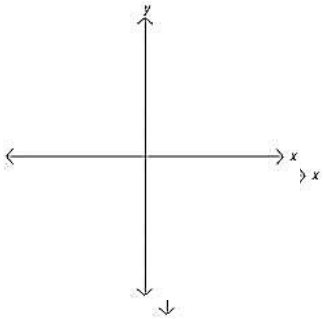
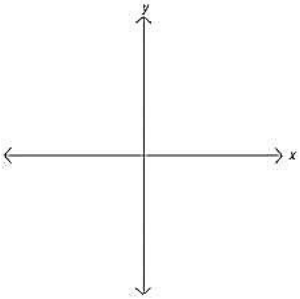
7. $y = x(x+6)(x-2)$



8. $y = 2x(x+2)(x-10)$



7. $y = -2(x-1)(x+1)(x-4)(x+4)$



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