Integrated Math 3   Name: _____

Unit 6: Polynomials

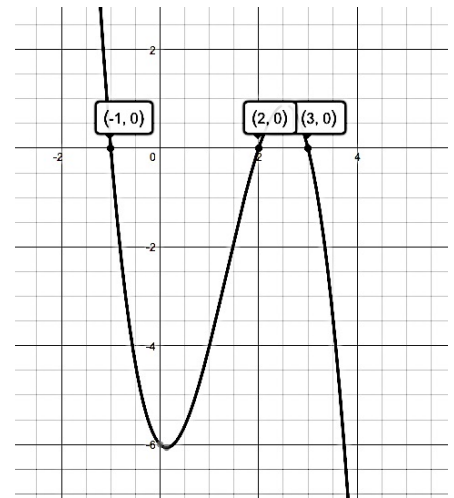6.10   Date: _____   Period:_____

Objective: Graph simple polynomial equations by finding zeros and end behavior.

Warm Up:

On the right is a graph of a polynomial. Identify the following:

➢ Degree of the polynomial: _____

➢ Sign of the leading coefficient: _____

➢ X-intercepts/Zeros: _____

(-1, 0)   (2, 0) (3, 0)

## Extending Ideas:

➢ Above you listed all x-intercepts of the polynomial. How could we write those x-intercepts as <u>factors</u>?

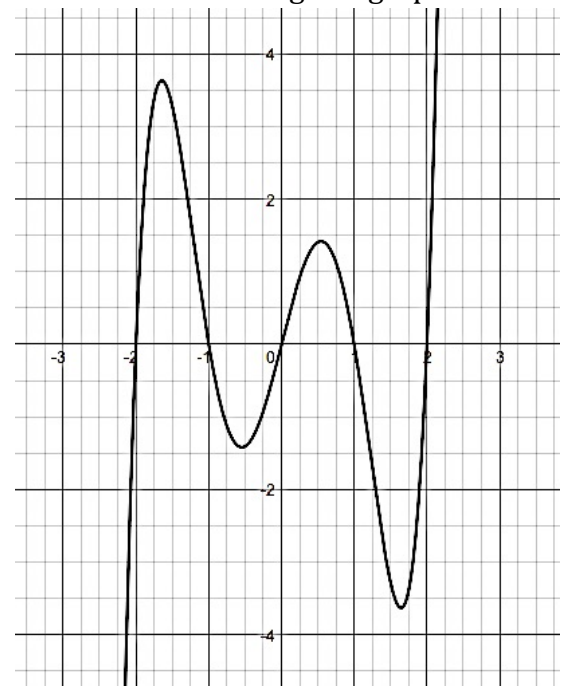➢ How could we translate those factors into <u>factored form</u>?

➢ Once the equation is in factored form, we are able to write it in <u>standard form</u> by multiplying the factors together!

Example 1: Write a possible equation of a polynomial in factored form from looking at a graph.

A.)

(-2, 0) (-1, 0) (0, 0)   (2, 0)
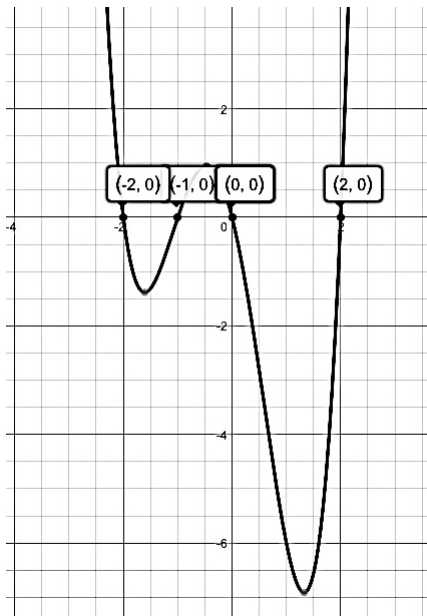
B.)

Example 2: Write a possible equation of a polynomial in factored form from written information.

A.) Write an equation of a quadratic polynomial with a positive leading coefficient that has x-intercepts at $x = 4, 6$. Sketch an image of this polynomial.

B.) Write an equation of a cubic polynomial with a negative leading coefficient that has x-intercepts at $x = 0, 3, -1$. Sketch an image of this polynomial.

Example 3: Given $h(x) = x(2x + 5)(x - 4)^2$

a. Factor h(x) completely

e.   Identify the end behavior of h(x)
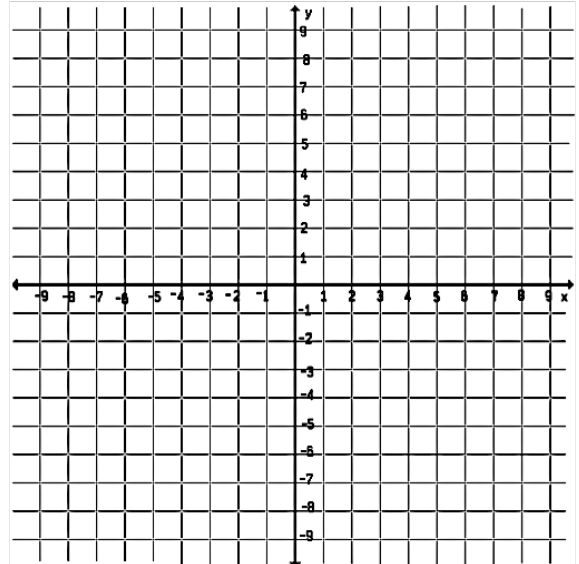
As x $\rightarrow\infty$, h(x) $\rightarrow$

As x $\rightarrow$-∞, h(x) $\rightarrow$

f. Draw a rough sketch of h(x)

b. Find the zeros of h(x)

c. Highest Degree _____   (even or odd)

d. Leading Coefficient _____   (+ or –)

Example 4: Given $m(x) = (-x + 3)(x^2 - 2x + 1)$

a. Factor m(x) completely

e.   Identify the end behavior of m(x)

As x $\rightarrow\infty$, m(x) $\rightarrow$

As x $\rightarrow$-∞, m(x) $\rightarrow$

f. Draw a rough sketch of m(x)

b. Find the zeros of m(x)

c. Highest Degree _____   (even or odd)

d. Leading Coefficient _____   (+ or –)