Precalculus Honors

Polynomials

LEARNING PLAN

(Chapter 4)

Name: _____

Date: _____

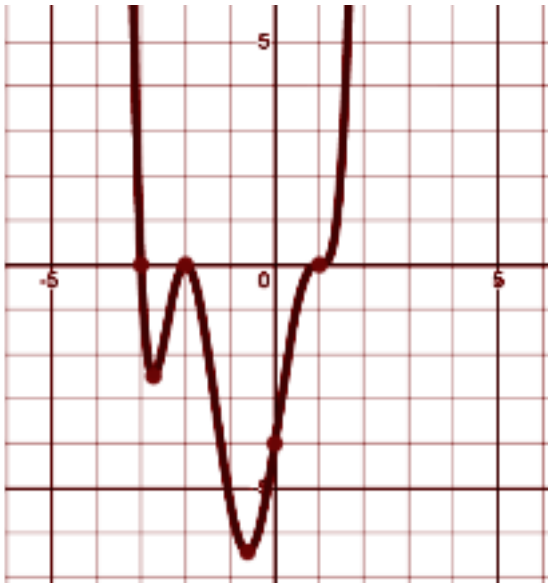
Period:____

G___

Skill/Understanding:	Review/Practice Problems
Interpreting Equations ❑ Given the equation of a polynomial function in *factored form*, I can identify the degree, the orientation, the location of x- and y-intercepts, and the shape of the graph at the x-intercepts. ❑ Given the equation of a polynomial function in *standard form*, I can identify the degree, the orientation, and the location of the y-intercept. ❑ I can rewrite the equation of a polynomial function from factored form to standard form, and vice versa. (Using polynomial division or multiplication.) ❑ I can use polynomial division and the quadratic formula to determine all real and complex roots, or factors, of a polynomial.	4-42, 4-58, 4-83, 4-122, and CL 4-131.
Writing Equations ❑ Given the graph of a polynomial, I can write a possible equation that accurately represents the orientation, the degree, the location of intercepts, and the shape of the graph at the x-intercepts. ❑ Given a description of a polynomial curve (intercepts, degree, behavior and an additional point on a graph) I can write the equation of a polynomial function. ❑ Given the roots (real and complex) of a polynomial, I can write the equation in factored form.	4-27, 4-76, 4-111, and CL 4-130.
Interpreting Graphs ❑ Given the graph of a polynomial, I can identify the orientation and the minimum degree. ❑ Given the graph of a polynomial, I can identify the minimum number of real and complex roots. ❑ Given the graph of a polynomial, I can identify repeated roots (single, double, or triple).	
Sketching Graphs ❑ I can make a reasonable sketch a polynomial given a description of the graph or an equation.	4-6, 4-14, 4-44, 4-75, and CL 4-129.

PRACTICE PROBLEMS:

1) The polynomial at right passes through the point (0, -4).



   a. Find the exact equation of the polynomial with the lowest possible degree.

   b. What is the degree of the polynomial?

   c. What are the roots of the polynomial?

2) A 3rd degree polynomial function has roots at x = –i and x = 2. The y-intercept is (0,-6). Write an equation for this function in factored form with real coefficients.

3) The roots of a quadratic equation are $x = 2 + i\sqrt{5}$ and $x = 2 - i\sqrt{5}$. Use these to write the equation of the parabola in standard form that has a stretch factor of 1.

4) Make a sketch of the following equation. You do not need to scale but make sure to label the important points:

$$y = -(x+1)^3(x-2)^2(x^2+6x+9)$$

5) Give the polynomial $p(x) = x^3 - 3x^2 + x - 3$.

   a. List all possible factors of p(x).

   b. List all possible roots of p(x).

   c. Rewrite p(x) in factored form using polynomial division.

   d. Which of the possible roots is an actual real root of the polynomial? How can you tell?

   e. Identify all the roots for p(x).