Unit 4 Handout

Polynomial relations (Part 2)

Topic 1 Fundamental Theorem of Algebra

Objectives: In this topic you will know what is the Fundamental Theorem of Algebra why is it important. You will utilize the conjugate to help writing a polynomial.

Objective 1:

What is the fundamental Theorem of algebra?

Watch the Fundamental Theorem of Algebra Presentation.

Given

1.
$$f(x) = x^4 + 2x^3 - 2x^2 - 3x - 18$$

2. $g(x) = 8x^5 + 26x^4 + 9x^3 + 4x^2 - 14x + 3$
3. $h(x) = 2x^6 + 5x^5 - 11x^4 - 20x^3 - 52x^2 - 160x + 96$
4. $j(x) = x^6 - 2x^5 + 4x^4 - 7x^3 - 2x^2 + 4x - 8$

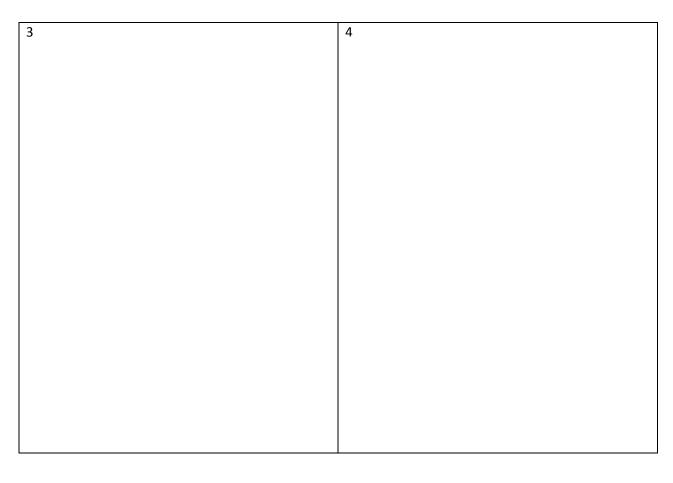
Ex1: Identify the number of zeros for the functions.

1	2
3	4

Ex2: Each function above has some rational zeros. Identify them.

1.	2.

3.	4.		
Ex3: For each function, find all non-rational zeros.			
1	2		



Objective 2: Use conjugates to write a polynomial

Except mentioned otherwise, find a function with rational coefficients that has the following roots. Also, the leading coefficient is 1.

1.
$$2,-2+\sqrt{3},-\frac{1}{2}+i\frac{\sqrt{5}}{2}$$

2. $-1, -2, \frac{1}{2}, 4i, -1 + \sqrt{6}$

3.
$$-4,1,2-\sqrt{6}$$

4.
$$\sqrt{3}-2, \sqrt{7}, 2i-3$$

Topic 2 Graph a Polynomial

Objectives: Use end behaviors, and zeros, to sketch the polynomial.

Sketch
$$f(x) = -3(x+1)(x-2)^2$$

Identify the x-intercepts and y-intercept, and domain where f(x) is positive or negative.

Scketch and identify x-intercepts and y-intercept

1.
$$f(x) = -3(x-2)(x+3)(x+1)$$

2. $g(x) = 4(x-1)(x+4)(x-3)$	