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

3	4

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