Class Discussion

Unit 2 Topic 5 Part 2 Fundamental Theorem of Algebra

Objective:

      1. Introduce Conjugate Pair Theorem

      2. Construct a polynomial based on the given zeroes

Conjugate Pair Theorem

If $a+bi$ is a zero for $f(x)=0$ and all coefficients of $f(x)$ are real numbers, then $a-bi$ must also

be a zero of $f(x)=0$.

Example 1: Identify which of the following polynomials only has real coefficients

(A) $f(x)=ix^4+3x^3+2x^2+11x-3$

(B) $f(x)=x^4+\sqrt{3}x^3-\sqrt{5}x^2+2x-1$

(C) $f(x)=x^3-\dfrac{1}{2}x^2+x-12$

(D) $f(x)=2x^4-\sqrt{3}x^2+5x-(i+2)^2$

Example 2:

Find the polynomial in general form if $\deg(f(x))=3$,all coefficient of the polynomials are real and

$f(x)$ has zeroes of $(2-i)$ and $-\dfrac{1}{2}$. Also the remainder of $f(x)\div(x-3)$ is 7.