King Fahd University of Petroleum and Minerals
Prep-Year Math Program
Math 001 - Term 131
Recitation (3.3)

Question 1: If $x+2$ is a factor of the polynomial $p(x) = x^5 - 2x^3 + 5x^2 - kx + 2$ find value of k.   **Answer:** $\boxed{k = -3}$

Question 2: If $x = -1$ is a zero with multiplicity 2 of the polynomial
$P(x) = x^4 + x^3 + x^2 + kx + k - 1$
Then find k
Answer: $\boxed{k = 3}$

Question 3: According to Descartes' Rules of Signs, find the number of possible positive and the number of possible negative real zeros of the polynomial
$$P(x) = 5x^4 + x^3 + 3x^2 - 3x - 1$$
Answer: $p(x) = 5x^4 + x^3 + 3x^2 - 3x - 1$ $\Rightarrow$ One positive real zero

$p(-x) = 5x^4 - x^3 + 3x^2 + 3x - 1$ $\Rightarrow$ Either 3 negative or one negative real zero

: One positive and either three or one negative zeros

Question 4: If $x = i$ is a zero of $P(x) = 8x^5 - 12x^4 + 14x^3 - 13x^2 + 6x - 1$, then find the other zeros

Answer: The other zeros are $-i$, $\dfrac{1}{2}$, $\dfrac{1}{2}$, $\dfrac{1}{2}$.

The other zeros are $-i$ and $\dfrac{1}{2}$ with multiplicity 3

Question 5: The Polynomial $p(x) = 8x^3 + 8x^2 - 4x - 1$ has
A) one rational and two irrational zeros.
B) no real zeros.
C) three irrational zeros.
D) two rational and one irrational zeros.
E) three irrational zeros.

Question 6: A polynomial of lowest degree with real coefficients having $-2i, i$ and 0 of multiplicity 2 as roots is.

A) $x^5 + 3x^3 + 4x$ D) $x^2(x + 2i)^2(x - i)^2$

B) $x^6 + 5x^4 + 4x^2$ E) $x^2(x^2 - 4)(x^2 - 1)$

C) $x^4 + ix^3 + 2x^2$

Answer: $x^6 + 5x^4 + 4x^2$