

**King Fahd University of Petroleum and Minerals**  
**Prep-Year Math Program**  
**Math (001)-Term (181)**  
**Recitation (3.5)**

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**Question 1:** If  $-i$  is a zero of the polynomial  $P(x) = x^4 - 4x^3 + 5x^2 - 4x + 4$  then the number of the  $x$ -intercepts of the graph of  $P$  is equal to

- (a): 0            (b): 1            (c): 2            (d): 3            (e): 4

**Answer:** (b): 1

**Question 2:**

If  $1+i$  is a zero of  $P(x) = x^3 - x^2 - ix^2 - 16x + 16 + 16i$ , then find the sum of all zeros of  $P(x) =$

- (a) 0            (b)  $1+i$             (c)  $1-i$             (d) 4            (e)  $-4$

**Answer: (b)** The sum of all zeros is  $1+i$

**Question 3:** Find a polynomial function of least degree having only *real coefficients* with zeros  $1+i$  and  $-1-i$

**Answer:**  $P(x) = x^4 + 4$

**Question 4:** Find all the zeros of the polynomial  $P(x) = x^5 + x^3 + 8x^2 + 8$

**Answer:**  $\pm i, -2, 1 \pm \sqrt{3}i$

**Question 5:** Find the polynomial with complex coefficients of the smallest possible degree for which  $i$  and  $1+i$  are zeros and in which the coefficient of the highest power is 1.

**Answer:**  $P(x) = x^2 - (1+2i)x - 1+i$