

**King Fahd University of Petroleum and Minerals**  
**Prep-Year Math Program**  
**Math (001)-Term (141)**  
**Recitation R.4**

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**Question 1:** Factor the following completely :

(a)  $9x^2 + 3x - y - y^2$

(b)  $x^6 + 7x^3 - 8$

(c)  $4x^3 - 8x^2y - xy^2 + 2y^3$

**Answered: (a):**  $9x^2 + 3x - y - y^2 = (3x - y)(3x + y + 1)$

**(b):**  $x^6 + 7x^3 - 8 = (x + 2)(x^2 - 2x + 4)(x - 1)(x^2 + x + 1)$

**(c):**  $4x^3 - 8x^2y - xy^2 + 2y^3 = (x - 2y)(2x + y)(2x - y)$

**Question 2:**

Find all positive values of  $k$  such that  $16x^2 - 40xy + ky^2$  is a perfect square trinomial.

**Answer:**  $k = 25$

**Question 3:** One factor of the polynomial  $x^2y^2 - 1 - 2xyz + z^2$  is

(a)  $(xyz - 1)$

(b)  $(xy + z + 1)$

(c)  $(xy - z - 1)$

(d)  $(xy + z - 1)$

(e)  $(x + y + z + 1)$

**Answer: (c):**  $(xy - z - 1)$

**Question 4:** Factorization of:  $10x^3y - 15xy^3 + 25x^2y^2$  is equal to:

(a)  $5xy(2x + y)(x - 3y)$

(b)  $10xy(x - y)(x + 3y)$

(c)  $5xy(2x - y)(x + 3y)$

(d)  $5xy(x - y)(2x + 3y)$

(e)  $5(2x^2 - y^3)(x + 3y)$

**Answer: (c):**  $5xy(2x - y)(x + 3y)$

**Question 5:** Factor  $x^4 + x^2y^2 + 25y^4$ . (Hint: add and subtract a term)

**Answered:**  $x^4 + x^2y^2 + 25y^4 = (x^2 + 5y^2 + 3xy)(x^2 + 5y^2 - 3xy)$