# King Fahd University of Petroleum and Minerals
## Prep-Year Math Program
## Math 001 - Term 061
## Recitation Hour (P3 & P4)

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**Question1**

Given the polynomial $(2x-1)(2-x)+(3x-1)^3$ $= 4x - 2x^2 - 2 + x + (3x)^3 + 3(3x)^2(-1) + 3(3x)(-1)^2 + (-1)^3$

$= 5x - 2x^2 - 2 + 27x^3 - 27x^2 + 9x - 1$

$= 27x^3 - 29x^2 + 14x - 3$

a. Write the given polynomial in the standard form.

b. Complete the following table:

| The leading coefficient is | The constant term is | The coefficient of is $x^2$ |
|---|---|---|
| 27 | $-3$ | $-29$ |

**Question2**

Factor each of the following trinomial

*a)* $x^2 - 10x - 24 = (x-12)(x+2)$

*b)* $51x^2 - 5x - 4 = (17x+4)(3x-1)$

**Question3**

Factor completely

*a)* $x^6 + 63x^3 - 64$ let $u = x^3$

$= u^2 + 63u - 64 = (u+64)(u-1) = (x^3+4^3)(x^3-1^3)$

$= (x+4)(x^2-4x+16)(x-1)(x^2+x+1)$

*b)* $6x(3x+1)^3 - (3x+1)^4$

**Question4**

Factor by grouping

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

$= (3x-y)(3x+y+1)$

*b)* $36x^2 - y^2 - 4yz - 4z^2 = (6x)^2 - (y-2z)^2$

$= (6x - (y-2z))(6x + (y-2z)) = (6x - y + 2z)(6x + y - 2z)$

**Question5**

Find all positive values of $k$ such that $4x^2 - 12xy + ky^2$ is a perfect-square trinomial.

$a = 4,\ b = -12,\ c = k$

$b^2 - 4ac = 0 \Rightarrow (-12)^2 - 4 \cdot 4 \cdot k = 0$

$\Rightarrow k = 9$