King Fahd University of Petroleum and Minerals
Prep-Year Math Program
Math (001)-Term (181)
Recitation P.5

Question 1: If the coefficient of x in the product $\left(kx + \dfrac{2}{k}\right)^2 - \left(3x + \dfrac{1}{k}\right)^3$ is 0, then find the value(s) of k.

Answer: (c) $\boxed{k = \pm\dfrac{3}{2}}$

Question 2: Which one of the following is a polynomial of degree 2?

(a) $x^2 + \dfrac{2}{x} + x + 1$

(b) $x^2 + x^{3/2} + \sqrt{2}$

(c) $(3x + 2)^3 + \sqrt{2}\,x^2 - 27x^3$

(d) $\dfrac{x}{x^3 - 1}$

(e) $x^2 + x + 1 + \sqrt{x}$

Answer: **(a):** No   **(b):** No   **(c):** Yes.   **(d):** No   **(e):** No

Question 3: If $X = (a - 2b)^3$ and $Y = (2a + b)^3$, then find $X - Y$.

Answer: $-7a^3 - 18a^2 b + 6ab^2 - 9b^3$

Question 4: Perform the following indicated operations, and simplify:

(a): $\left(c + \dfrac{1}{c}\right)^2$ (b): $\left(\sqrt{h^2 + 1} + 1\right)\left(\sqrt{h^2 + 1} - 1\right)$

(c): $(x + y + z)(x - y - z)$ (d): $a^x(a^x - 4)(a^x + 1) - (a^x - 1)^3$

Answer: (a): $\dfrac{(c^2 + 1)^2}{c^2}$

(b): h^2

(c): $x^2 - (y + z)^2$

(d): $-7a^x + 1$