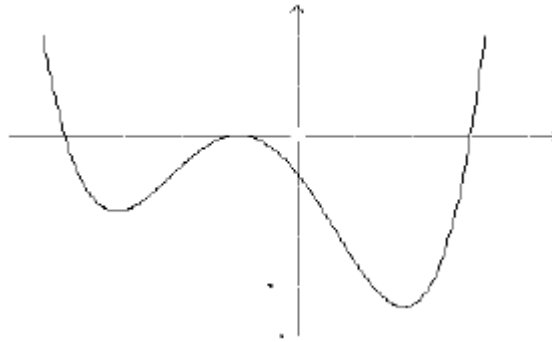**King Fahd University of Petroleum and Minerals**
Prep-Year Math Program
Math (001)-Term (181)
Recitation (3. 2)

Question 1: If $f(x) = a(x+4)(x^2+2x+1)(3-x)$ has the graph below then a

reasonable possible value to the leading coefficient a that will justify the end behavior

(Far left and Far right behavior) of the graph is

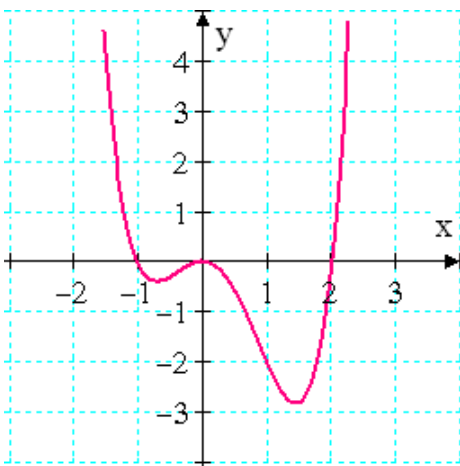(a) $a = -1$

(b) $a = 2$

(c) $a = 0$

(d) $a = 1$

(e) $a = \frac{1}{2}$

Answer: (a): $a = -1$

Question 2: Graph of the following polynomials

(a): $P(x) = x^4 - x^3 - 2x^2$ **(b):** $P(x) = 2x^3 - 7x^2 + 2x + 3$

Solution: (a): $P(x) = x^4 - x^3 - 2x^2 = x^2(x^2 - x - 2) = x^2(x-2)(x+1)$
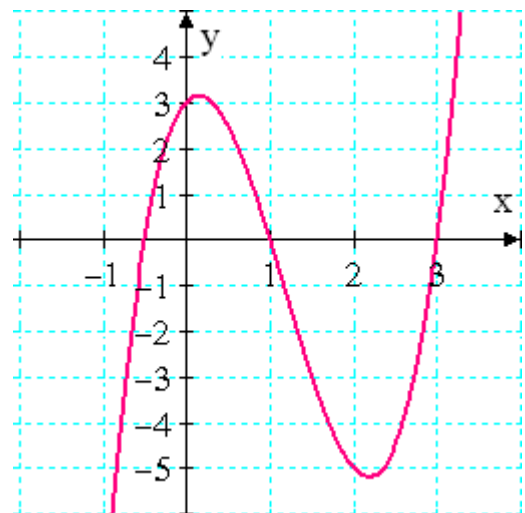

(b): $P(x) = 2x^3 - 7x^2 + 2x + 3$

1	2	−7	2	3
		2	−5	−3
	2	−5	−3	0

$P(x) = (x-1)(2x^2 - 5x^2 - 3)$.

$P(x) = (x-1)(2x+1)(x-3)$

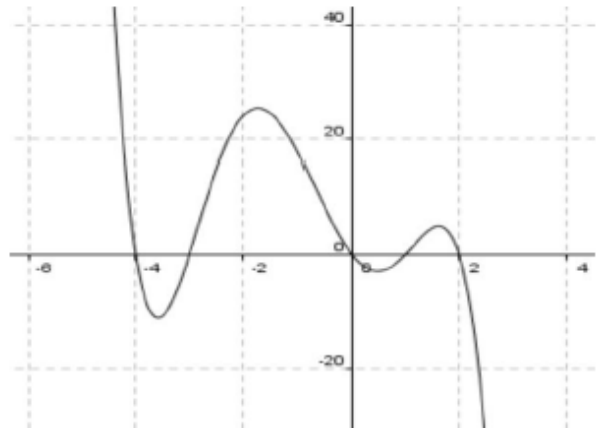**Question 3:** Which one of the following polynomial has the graph given below?

(a) $P(x) = \frac{1}{2}x(x-1)(x-2)(x+3)(x+4)$

(b) $P(x) = -\frac{1}{2}x(x-1)(x-2)(x+3)(x+4)$

(c) $P(x) = -\frac{1}{2}x(x-1)(x-2)(x+4)^2$

(d) $P(x) = \frac{1}{2}x(x-1)^2(x-2)(x+3)(x+4)$

(e) $P(x) = -\frac{1}{2}x(x-1)(x+2)(x+3)(x+4)$

Answer: (b) the function of the graph is $P(x) = -\frac{1}{2}x(x-1)(x-2)(x+3)(x+4)$.

Question 4: Which one of the following statements is TRUE about the graph of the polynomial $P(x) = x^3(x+2)(x-3)^2$

(a) The graph has four turning points.

(b) The graph crosses the x-axis at three points.

(c) The graph lies above x-axis in the interval $(-2, 0)$.

(d) The graph has 6 x-intercepts.

(e) The graph is tangent at $x = 0$ and $x = 3$.

Answer: (e) is true because the graph is tangent at $x = 0$ and $x = 3$.

Question 5: By the intermediate value theorem the polynomial

$P(x) = 3x^3 + 7x^2 + 3x + 7$ has at least one zero on:

(a) $[0, 1]$

(b) $[-2, -1]$

(c) $[-1, 0]$

(d) $[1, 2]$

(e) $[-3, -2]$

Answer: (d) $[-3, -2]$