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CC ALGEBRA 2

TROICI

MIDTERM REVIEW #2

1. What are the zeroes of  $2(x+6)(x-3)(x-3)(x+4) = 0$ ?

(1)  $\{-6, -4, 3\}$

(7)  $\{-3, 8\}$

(3)  $\{0, -6, 4, 3\}$

(4)  $\{6, 4, -3, -3\}$

$$2(x+6)(x-3)(x-3)(x+4) = 0$$

|    |   |   |    |
|----|---|---|----|
| -6 | 3 | 3 | -4 |
|----|---|---|----|

2. Which is a factored form of  $x^4 - 16$ ?

(1)  $(x^2 - 2)(x^2 + 2)$

$(x^2 - 4)(x^2 + 4)$

(2)  $(x^2 + 4)(x^2 - 2)(x^2 + 2)$

$(x+2)(x-2)(x^2 + 4)$

(3)  $(x^2 + 4)(x - 2)(x + 2)$

(4)  $(x^2 + 4)(x - 4)(x + 4)$

3. The factors of  $x^4 - 13x^2 + 36$  when factored completely are:

(1)  $(x^2 + 9)(x^2 + 4)$

$x^4 - 13x^2 + 36$

$(x^2 - 9)(x^2 - 4)$

(2)  $(x+3)(x-3)(x+2)(x-2)$

$(x+3)(x-3)(x+2)(x-2)$

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

(4)  $(x+3)(x+3)(x+2)(x+2)$

4. What is the remainder when  $x^{51} - 21x + 20$  is divided by  $x - 1$ ?

$P(1) = \text{Remainder}$

$P(1) = (1)^{51} - 21(1) + 20$

$= 1 - 21 + 20$

$= \boxed{0}$

5. Solve the following equation using the quadratic formula and leave answer in simplest radical form.

$$3x^2 - 3x + 7 = 9x + 3 \quad *set = to zero!*$$

$$\frac{-2x - 3 - 9x + 3}{3x^2 - 12x + 4 = 0}$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$a = 3$$

$$b = -12$$

$$c = 4$$

$$3x^2 - 12x + 4 = 0$$

$$x = \frac{-(-12) \pm \sqrt{(-12)^2 - [4(3)(4)]}}{2(3)}$$

$$x = \frac{12 \pm \sqrt{96}}{6} < \frac{\sqrt{16}}{\sqrt{6}}$$

mickey mouse!

$$x = \frac{12 \pm 4\sqrt{6}}{6} = \frac{6 \pm 2\sqrt{6}}{3}$$

6. Consider the polynomial function  $y = 5 - 3x^2 - 2x^3$ .

- a) Write the function in standard form.

$$y = -2x^3 - 3x^2 + 5$$

- b) What is the degree of this function? 3

- c) What is the leading coefficient? -2

- d) How many distinct zeros could this function have? 3

- e) What is the end behavior of the graph of this function?

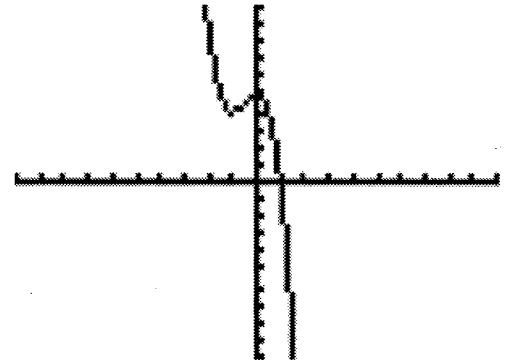
High, low

$$\text{as } x \rightarrow -\infty, f(x) \rightarrow \infty$$

$$\text{as } x \rightarrow \infty, f(x) \rightarrow -\infty$$

- f) Is the function odd, even, or neither? Explain.

Neither, no symmetry



7. Consider the polynomial function:  $P(x) = 2x^3 + 3x^2 + cx - 3$ . Find all solutions of  $P$  if  $x-1$  is a factor.

$$\hookrightarrow P(1) = 0$$

① Find 'c'

$$P(1) = 2(1)^3 + 3(1)^2 + c(1) - 3 = 0$$

$$2 + \cancel{3} + c - \cancel{3} = 0$$

$$2 + c = 0$$

$$c = -2$$

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

② Factor (Grouping!)

$$x^2(2x+3) - 1(2x+3)$$

$$(x^2-1)(2x+3)$$

$$(x+1)(x-1)(2x+3) = 0$$

|    |   |                |
|----|---|----------------|
| -1 | 1 | $-\frac{3}{2}$ |
|----|---|----------------|

