

MONTGOMERY COLLEGE
Department of Mathematics
Rockville Campus

MA 103 KATIRAIIE QUIZ #6A Part I SECTIONS (5.5 - 5.6, and 6.1) FALL 2007

NAME _____ SCORE: ____ / 10

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1) Factor the following:

a) $16x^4 + 81y^4$

Not factorable

b) $36 - (n-2)^2$

$$\begin{aligned} & (6 - (n-2))(6 + (n-2)) \\ &= (6 - n + 2)(6 + n - 2) \\ &= \boxed{(8 - n)(4 + n)} \end{aligned}$$

c) $4y^4 + 4y^3 + y^2$

$$\begin{aligned} & y^2(4y^2 + 4y + 1) \\ &= y^2(2y + 1)(2y + 1) \\ &= \boxed{y^2(2y + 1)^2} \end{aligned}$$

d) $3t^2 - 5t - 8$

$$\begin{aligned} & \begin{array}{r} \\ \\ \\ \\ \\ \end{array} \\ &= 3t^2 + 3t - 8t - 8 \\ &= 3t(t+1) - 8(t+1) \\ &= \boxed{(3t - 8)(t + 1)} \end{aligned}$$

e) $64x^2 + 16x + 1$

$$\begin{aligned} &= (8x + 1)(8x + 1) \\ &= \boxed{(8x + 1)^2} \end{aligned}$$

2) Solve the following algebraically:

a) $3x^3 + 15x^2 + 12x = 0$

b) $4x^2 + 25 = 20x$

$$3x(x^2 + 5x + 4) = 0$$

$$4x^2 - 20x + 25 = 0$$

$$3x(x+4)(x+1) = 0$$

$$(2x-5)(2x-5) = 0$$

$$(x=0) \quad (x=-4) \quad (x=-1)$$

$$2x - 5 = 0$$

$$x = \frac{5}{2}$$

3) The height in feet reached by a batted baseball after t seconds is given by $h(t) = -16t^2 + 66t + 2$

Determine when the baseball is 2 feet in the air.

$$-16t^2 + 66t + 2 = 2$$

$$-16t^2 + 66t = 0$$

$$-2t(8t - 33) = 0$$

$$t = 0 \text{ and } t = \frac{33}{8} \text{ seconds}$$

4) Solve the following rational equations

a) $\frac{5}{2x+1} = 2x$

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

$$5 = 2x(2x+1)$$

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

$$5 = 4x^2 + 2x$$

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

$$4x^2 + 2x - 5 = 0$$

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

$$x = \frac{2 \pm \sqrt{4 - 4(2)(3)}}{2(2)} = \text{No Real solution}$$

$$x = \frac{-2 \pm \sqrt{2^2 - 4(4)(-5)}}{8} = \frac{-2 \pm \sqrt{4 + 80}}{8} = \frac{-2 \pm \sqrt{84}}{8} = \frac{-2 \pm 2\sqrt{21}}{8} = \frac{-1 \pm \sqrt{21}}{4}$$