COLLEGE ALGEBRA

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GPS # 36 **4.3** **SOLUTION OF POLYNOMIAL EQUATIONS II** Class Time: 11:30 Date: 3-27-08

Useful Guidelines:

* Square Root and Cube Root: The cube root function is defined for all inputs, whereas the square root function is defined only for nonnegative inputs.
* Square Root Property: If k is a nonnegative numbers and $x^2 = k$, then $x = \pm\sqrt{k}$.
* Solve Equations with Cube Roots: The solution to the equation $x^3 = k$ is $x = \sqrt[3]{k}$.
* Power function: $f(x) = x^p$, where p is a rational number.
* Root function: $f(x) = \sqrt[n]{x}$, where $n \geq 2$.

20 Good Job

1. Use the square root property to solve each equation and give the solution set.

a) $x^2 = 49$

$X = \pm\sqrt{49}$

$X = \pm 7$

$\{-7, 7\}$

b) $x^2 - 8 = 0$

$X^2 = 8$

$X = \pm 2\sqrt{2}$

$\{-2\sqrt{2}, +2\sqrt{2}\}$

$\{x | X = \pm 2\sqrt{2}\}$

c) $(x-4)^2 = 25$

$X - 4 = \pm 5$

$x = 9$ or $x = -1$

$\{-1, 9\}$

d) $(2x-5)^2 = 12$

$2X - 5 = \pm 2\sqrt{3}$

$2X = \frac{5}{2} \pm \frac{2\sqrt{3}}{2}$

$X = 2.5 \pm \sqrt{3}$

$\{x | X = 2.5 \pm \sqrt{3}\}$

2. Use the cube roots to solve each equation and give the solution set.

a) $2x^3 - 250 = 0$

$\frac{2X^3}{2} = \frac{250}{2}$

$X^3 = 125$

$X = \sqrt[3]{125}$

$X = 5$

$\{x | X = 5\}$

b) $\sqrt[3]{(y-1)^3} = \sqrt[3]{8}$

$y - 1 = 2$

$y = 3$

$\{y | y = 3\}$

3. Solve the polynomial equation by using the root method and give the solution set.

a) $x^3 - 60 = 4$

$\sqrt[3]{X^3} = \sqrt[3]{64}$

$X = 4$

$\{x | x = 4\}$

b) $6x^4 - 24x^2 = 0$

$6x^2(x^2 - 4) = 0$

$6x^2 = 0$ or $x^2 - 4 = 0$

$X = 0$ $(X-2)(X+2)$

$X = \pm 2$

$\{x | x = 0$ or $x = \pm 2\}$