

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 $n \geq 2$.

no sub no sub!

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

a) $\sqrt{x^2} = 49$

$x = \pm 7$

Sol set: $\{-7, 7\}$

b) $x^2 - 8 = 0$

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

Sol set: $\{-2\sqrt{2}, 2\sqrt{2}\}$

$\sqrt{4 \cdot 2} = 2\sqrt{2}$

c) $\sqrt{(x-4)^2} = 25$

$x - 4 = \pm 5$

$x = 4 \pm 5$

$x = -1, 9$

Sol set: $\{-1, 9\}$

d) $\sqrt{(2x-5)^2} = 12$

$2x - 5 = \pm\sqrt{12}$

$2x = 5 \pm \sqrt{4 \cdot 3}$

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

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

Sol set: $\{\frac{5}{2}, \sqrt{3}, -\sqrt{3}\}$

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

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

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

$x^3 = 125$

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

$x = 5$ Sol set: $\{x/x=5\}$

b) $(y-1)^3 = 8$

$y - 1 = 2$

$y = 3$

Sol set: $\{y/y=3\}$

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

a) $x^3 - 60 = 4$
 $+60 +60$

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

$x = 4$

Sol set: $\{x/x=4\}$

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

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

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

$x = 0$ or $x = \pm 2$

Sol set: $\{x/x=0 \text{ or } x = \pm 2\}$