Name Key
Mrs. Roumbos

Date_____
8R Period_____

I. Solving Equations Using Square Roots and Cube Roots

***On Calculator : $\sqrt{\ }$ = [2nd] [x^2]

$\sqrt[3]{\ }$ = [3] [2nd] [^]

A) Review: Square roots and cube roots

Simplify the following:

1) $\sqrt{81}$ = 9

2) $\sqrt[3]{729}$ = 9

3) $\sqrt[3]{343}$ = 7

4) $\sqrt{121}$ = 11

5) $\sqrt[3]{\frac{125}{512}} = \frac{\sqrt[3]{125}}{\sqrt[3]{512}} = \frac{5}{8}$

6) $\sqrt{\frac{100}{400}} = \frac{\sqrt{100}}{\sqrt{400}} = \frac{10}{20}$

* Don't reduce

B) Using Roots to Solve Equations

You can use roots to solve equations where a variable is raised to a power. Since taking the root is the inverse of raising to a power, you can simplify these types of equations by taking the root of both sides.

Ex's : Solve $x^2 = 16$

$\sqrt{x^2} = \sqrt{16}$

$x = 4$

Solve : $x^3 = 8$

$\sqrt[3]{x^3} = \sqrt[3]{8}$

$x = 2$

**Remember:

$\sqrt{x}$ (square root) is the inverse of x^2 and

$\sqrt[3]{x}$ (cube root) is the inverse of x^3

Now you try!

Solve each equation for x

1) $\sqrt{x^2} = \sqrt{144}$

$x = 12$

2) $\sqrt[3]{x^3} = \sqrt[3]{27}$

$x = 3$

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

$x = 7$

4) $\sqrt[3]{x^3} = \sqrt[3]{512}$

$x = 8$

5) $\sqrt{x^2} = \frac{\sqrt{16}}{\sqrt{49}}$

$x = \frac{4}{7}$

6) $\sqrt[3]{x^3} = \frac{\sqrt[3]{8}}{\sqrt[3]{64}}$

$x = \frac{2}{4}$

* Don't reduce

7) $x^2 + 5 = 105$

$-5 \quad -5$

$\sqrt{x^2} = \sqrt{100}$

$x = 10$

8) $x^3 + 50 = 3425$

$-50 \quad -50$

$\sqrt[3]{x^3} = \sqrt[3]{3375}$

$x = 15$

9) $x^2 - 200 = 200$

$+200 \quad +200$

$\sqrt{x^2} = \sqrt{400}$

$x = 20$

10) $x^2 - \frac{2}{3} = -\frac{2}{9}$

$+\frac{2}{3} \quad +\frac{2}{3}$

$\sqrt{x^2} = \frac{\sqrt{4}}{\sqrt{9}}$

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

11) $x^3 + \frac{1}{2} = \frac{593}{686}$

$-\frac{1}{2} \quad -\frac{1}{2}$

$\sqrt[3]{x^3} = \frac{\sqrt[3]{125}}{\sqrt[3]{343}}$

$x = \frac{5}{7}$

12) $x^2 + \frac{3}{4} = \frac{13}{16}$

$-\frac{3}{4} \quad -\frac{3}{4}$

$\sqrt{x^2} = \frac{\sqrt{1}}{\sqrt{16}}$

$x = \frac{1}{4}$

*** Can you take the $\sqrt{-64}$?

NO. It is not real B/C NO # squared will give you -64

$8 \cdot 8 = 64$

B/C $(-8)(-8) = 64$

****Can you take the $\sqrt[3]{-64}$?

yes!! B/C $(-4)^3 = (-4)(-4)(-4) = -64$

II. Word Problem Review

1) At Antonio's Pizza, a pepperoni pizza costs $6.95. Extra toppings are available for $0.50 each. If Greg bought a pizza for $8.45, how many extra toppings, T, did he order?

$.50T + 6.95 = 8.45$

$-6.95 \quad -6.95$

$\frac{.50T}{.50} = \frac{1.5}{.50}$

$T = 3$

3 toppings

2) Nikki bought a bag of jelly beans. She divided the jelly beans equally among herself and three friends. There was a total of 96 jelly beans in the bag, how many jelly beans (j) did each person receive?

$\frac{4j}{4} = \frac{96}{4}$

$j = 24$

24 jelly beans

3) Liz spent a total of $44.88 at the mall. She has $7.62 left. How much money, m, did Liz have when she arrived at the mall?

$m - 44.88 = 7.62$

$+44.88 \quad +44.88$

$m = 52.5$

$52.50

***4) Melissa has 6 times as many quarters as Michelle. Together, they have a total of 896 quarters. How many quarters, q, does Michelle have?

q = # of q's Michelle has

$6q$ = # of q's Melissa has

$q + 6q = 896$

$\frac{7q}{7} = \frac{896}{7}$

$q = 128$

Michelle has 128 q's