## I. Solving Equations Using Square Roots and Cube Roots

\*\*\*On Calculator:  $\sqrt{=}$ 

# A) Review: Square roots and cube roots

Simplify the following:

1) 
$$\sqrt{81}$$
 = 9

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

5) 
$$\sqrt[3]{\frac{125}{512}} = \frac{3\sqrt{125}}{3\sqrt{512}} = \frac{5}{8}$$
 6)  $\sqrt{\frac{100}{400}} = \frac{\sqrt{100}}{\sqrt{400}} = \frac{10}{\sqrt{400}}$ 

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

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  $x^2 = 16$ 

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

Solve:  $x^3 = 8$ 

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

$$y = 2$$

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

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

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

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

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

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



7) 
$$x^{2}+5=105$$
 $-5-5$ 
 $\sqrt{x^{2}}=\sqrt{100}$ 
 $x=10$ 

8) 
$$x^{3} + 50 = 3425$$

$$-50 - 50$$

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

$$(x = 15)$$

9) 
$$x^{2} - 200 = 200$$
 $1200 + 1200$ 
 $1200 + 1200$ 
 $1200 + 1200$ 
 $1200 + 1200$ 

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

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

$$\sqrt{\chi^{2} - \sqrt{\frac{4}{9}}}$$

$$\sqrt{\chi^{2} - \sqrt{\frac{4}{9}}}$$

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

$$\frac{1}{2} = \frac{1}{2}$$

$$\frac{1}{3}(x^3 - \frac{3}{12})$$

$$\frac{1}{3}(x^3 - \frac{3}{12})$$

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

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

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

$$\sqrt{x^{2} - \sqrt{4}}$$

B/c No #

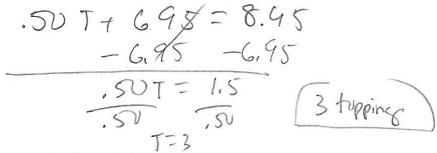
\*\*\* Can you take the  $\sqrt{-64}$ ?

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

$$415! B/C (-4)^3 = -64$$

#### 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?



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?

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?

$$m - 44.88 = 7.62$$
  
 $t94.88 + 44.88$  [\$52.50)  
 $m = 52.5$ 

\*\*\*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?

$$q = \# of QS$$
 $q + 6q = 896$ 
 $q = 896$