Activity 7.1 Roots and Radicals Name:_____KEY_____
Math 95

1. In general, we state that if $x^n = a$, then x is called an ____n^th root_____ of a.

2. Evaluate, if possible. If the result is not a real number, state: Not a real number.

a. $\sqrt{49} =$ 7

b. $\sqrt[3]{-125} =$ -5

c. $\sqrt[6]{64} =$ 2

d. $\sqrt{25} =$ 5

e. $\sqrt{-25}$ = Not a Real Number

f. $-\sqrt{25} =$ -5

g. $\sqrt[3]{27} =$ 3

h. $\sqrt[3]{-27} =$ -3

i. $-\sqrt[3]{27} =$ -3

j. $\sqrt[4]{16} =$ 2

k. $\sqrt[4]{-16}$ = Not a Real Number

l. $-\sqrt[4]{16} =$ -2

m. $\sqrt[5]{32} =$ 2

n. $\sqrt[5]{-32} =$ -2

o. $-\sqrt[5]{32} =$ -2

3. The time, in seconds, that it takes for an object to fall, from rest, is given by $t = \frac{1}{4}\sqrt{d}$, in which d is the distance fallen in feet. Show your work and round to the nearest hundredth second.

a. Find the time required for an object to fall to the ground from a building that is 540 feet high. Interpret your results with a complete sentence.

$t = \frac{1}{4}\sqrt{540} \approx$ 5.81

It takes the object about 5.8 seconds to fall 540 feet.

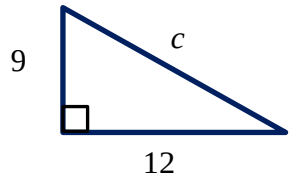
b. Find the time required for an object to fall to the ground from a building that is 660 feet high. Interpret your results with a complete sentence.

$t = \frac{1}{4}\sqrt{660} \approx$ 6.42

It takes the object about 6.4 seconds to fall 660 feet.

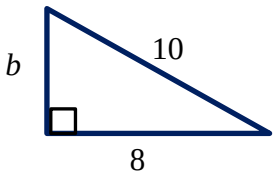
4. State the **Pythagorean Theorem**: In any right triangle, the square of the length of the hypotenuse = the sum of the squares of the length of the two legs: $a^2 + b^2 = c^2$

5. Find the missing length in the following right triangles using the Pythagorean Theorem. Express your answer in radical form where appropriate.

a. 

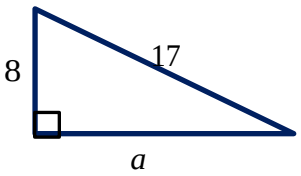
c = 15

$a^2 + b^2 = c^2$
$(9)^2 + (12)^2 = c^2$
$81 + 144 = c^2$
$\sqrt{225} = \sqrt{c^2}$
$15 = c$

b. 

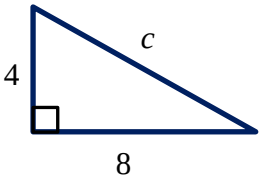
b = 6

$a^2 + b^2 = c^2$
$(8)^2 + b^2 = (10)^2$
$64 + b^2 = 100$
$\sqrt{b^2} = \sqrt{36}$
$b = 6$

c. 

a = 15

$a^2 + b^2 = c^2$
$a^2 + (8)^2 = (17)^2$
$a^2 + 64 = 289$
$\sqrt{a^2} = \sqrt{225}$
$a = 15$

d. 

c = $\sqrt{80}$

$a^2 + b^2 = c^2$
$(8)^2 + (4)^2 = c^2$
$64 + 16 = c^2$
$\sqrt{80} = \sqrt{c^2}$
$\sqrt{80} = c$