Name _____

Date _____ Pd_____

SQUARE ROOTS AND CUBE ROOTS

Three expressions with exponents are given below. For each expression, label the base and the exponent. Then, explain its mathematical meaning by writing it in expanded form.

5^3
EXPANDED:

m^5
EXPANDED:

100^2
EXPANDED:

Similar to the inverse operations of addition and subtraction, raising a value to an exponent also has an inverse operation. Use the table below to explore one example.

SQUARES AND SQUARE ROOTS	• Squaring a number is raising that number to a power of _____ or multiplying a number by itself. • The square root is an _____ operation of squaring a number and "undoes" an exponent of 2. • The _____ square root is known as the principle square root.	The square root of x: $\sqrt{x}$ "What number times itself will give me x?"

In 1-4, use squares and square roots to evaluate the given expression.

1. 15^2	2. $\sqrt{144}$	3. $(-6)^2$	4. $\sqrt{49}$

5. Three equations are given below. Use inverse operations to isolate the variable. Be sure to check your solution by plugging it back into the original equation.

a. $x^2 = 81$	b. $m^2 = 9$	c. $f^2 = 400$

A similar relationship between squares and square roots exists between cubes and cube roots.

CUBES AND CUBE ROOTS

- Cubing a number is raising that number to a power of _____ or multiplying it by itself three times.

- The cube root is an _____ operation of cubing a number and "undoes" an exponent of 3.

The cube root of x:

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

"What number multiplied by itself three times will give me x?"

Complete the table as a reference for the first ten perfect cubes.

1^3	2^3	3^3	4^3	5^3	6^3	7^3	8^3	9^3	10^3

In 6-9, use cubes and cube roots to evaluate the given expression.

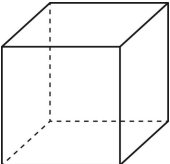| 6. $\sqrt[3]{512}$	7. $(-5)^3$	8. $\sqrt[3]{216}$	9. $\left(\frac{1}{4}\right)^3$

10. Three equations are given below. Use inverse operations to isolate the variable. Be sure to check your solution by plugging it back into the original equation.

a. $p^3 = 64$	b. $n^3 = 1{,}000$	c. $g^3 = 125$

Apply your knowledge of square roots and cube roots to answer the following questions.

11. Trisha's Treats, a local bakery, has a square menu on the wall that covers an area of 900 in².

a. Write an equation that could be used to find s, the side length of the sign.

b. What is the side length of the sign?

12. The volume of a cube is given below.

a. Write an equation that could be used to find x, the length of one side of the cube.

b. Solve for x.

$$V = 729 \text{ in}^3$$

Summarize today's lesson: