6-1 Squares and Cubes

I can square and cube a number.

Notes:

- Exponent - the superscript number that tell you how many times to write down the base and multiply.
- Exponents and powers are synonyms.
- Base - The value being raised to the power.
- Square or squaring a number - using an exponent of 2.

b

- Nickname is square because to find the area of a square, you take the length of one side of a square to the second power.
- Cube or cubing a number - using an exponent of 3.
- Nickname is cube because to find the volume of a cube, you take the length of one side of a cube to the third power.

- $\sqrt{}$ is the radical sign also called the root.
- The root is the inverse operation of the exponent.

- $\sqrt[3]{}$ - the 3 is the index.

- $\sqrt{}$ - has an index of 2.

- $\sqrt{16} = 4$ only take positive answer when the radical is already in the problem.
- $\sqrt[3]{8}$ - the 8 is the radicand
- The index asks, what number to that power gives you the radicand.
- Perfect squares are 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, …
- Perfect cubes are 1, 8, 27, 64, 125, …

1. Exponents

$4^2 = 4*4 =$ 16

$2^4 = 2*2*2*2 =$ 16

$5^3 = 5*5*5 =$ 125

$3^4 = (3 \cdot 3) \cdot (3 \cdot 3) = 81$

$9 \cdot 9$

81

2. Root

$\sqrt{4}$ means what number or numbers to the second power is 4.

$\sqrt{4} = 2$

$\sqrt{16} =$

$\sqrt[3]{8}$ means what number to the third power is 8.

$\sqrt[3]{8} = 2$

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3. Solve equation - take both answers since you put in the radical symbol.

$\sqrt{x^2} = \sqrt{25}$

$x = \pm 5$

$\sqrt{x^2} = \sqrt{\frac{5}{9}}$

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

4. Find the length of each side of a square if the area of the square is 36 square inches.

$\sqrt{x^2} = \sqrt{36}$

$x = \pm 6$

6 in – you can't have a negative length.

5. Find the length of each side of a square city block if the area of the block is 40,000 square feet.

$\sqrt{b^2} = \sqrt{40{,}000}$

$b = \pm 200$

200 ft

$2{,}000 \times 2{,}000 = 4{,}000{,}000$

$200 \times 200 = 40{,}000$

6. If the volume of a cube is 27 cubic cm, what is the length of each side of the cube?

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

$x = 3$

3 cm

7. The volume of a pet carrier of a large dog is 8 cubic feet. What are the dimensions of the carrier?

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

$x = 2$

2ft

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Assignment: 6-1 worksheet