

Section 1.2 – Squares and Square Roots

A _____ is a number that divides evenly into another number.

Ex: The factors of 6 are: _____

The factors of 12 are: _____.

Factors of Perfect Squares

The factors of **16** are: _____ (____ factors)

The factors of **49** are: _____ (____ factors)

A perfect square will always have an _____ number of factors.

Recall:

Since $4 \times 4 = 16$, **16 is the _____ of 4**, and **4 is the _____ of 16**.

We use radical symbols ($\sqrt{\quad}$) for square roots.

Ex: $\sqrt{25}$ means what number multiplies by itself to produce 25?

Answer:

$$\sqrt{81} =$$

$$\sqrt{36} =$$

$$\sqrt{196} =$$

Try the following:

What is the square root of:

- a) 36
- b) 121
- c) 4^2
- d) 7^2
- e) $\sqrt{16}$

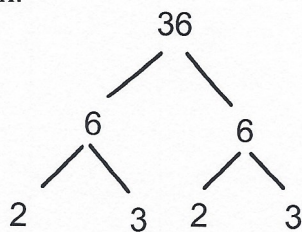
Other methods for finding square roots:

Prime Factorization:

Breaking a number into its prime factors.

We can use a factor tree:

Ex:



Since $2 \times 2 \times 3 \times 3 = 36$, we can group our pairs

$$(2 \times 2) \times (3 \times 3) = 36$$

$$2 \times 3 = 6, \text{ which is the square root.}$$

Try: 324

Multiples of 100:

This method for finding square roots will work if the number is a multiple of 100, that is, it has an even number of zeroes, and starts with a perfect square.

Ex:

$$\sqrt{2500}$$

$$\sqrt{1\ 440\ 000}$$

Example 1:

Find the square root of each, if possible:

a) $\sqrt{3600}$

b) $\sqrt{49000}$

c) $\sqrt{169000000}$