

SQUARE ROOTS

What does it mean to square a number?

If we square 9, we get

$$9 \cdot 9 = 9^2 = 81$$

If we square root 81, we get

$$\sqrt{81} \quad \text{NOTE: this is NOT a division symbol}$$

$\sqrt{81}$ is asking, "what number do you square to get 81?"

$$\sqrt{81} = \underline{\quad\quad} \quad \text{since} \quad \underline{\quad\quad} \cdot \underline{\quad\quad} = \underline{\quad\quad}$$

The square of an integer is known as a perfect square.

examples of perfect squares:

→ example 1: evaluate:

a) $\sqrt{0} =$

b) $\sqrt{1} =$

c) $\sqrt{x^2} =$

d) $\sqrt{2} = ?$ this cannot be done without a calculator. $\sqrt{2} \approx 1.414$

Note: In this course we will only be dealing with perfect squares.

→ example 2:

a) $3\sqrt{4}$

b) $2\sqrt{25}$

c) $\sqrt{64} + \sqrt{49}$

d) $5\sqrt{4} + \sqrt{9}$

e) $\sqrt{64} - \sqrt{16}$



example 3: evaluate:

a) $\sqrt{\frac{1}{4}}$

b) $\sqrt{\frac{49}{16}}$

c) $\sqrt{\frac{9}{36}}$

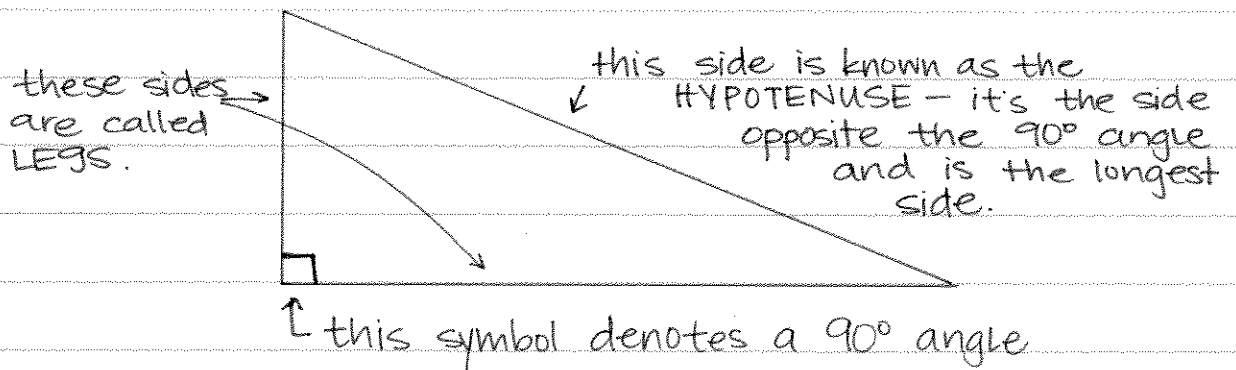
there are two methods to evaluate this problem:

METHOD 1: $\sqrt{\frac{9}{36}} =$

METHOD 2: $\sqrt{\frac{9}{36}} =$

RIGHT TRIANGLES

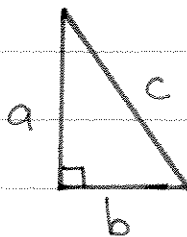
A right triangle is a triangle that has a 90° angle.



The formula to find the side lengths of a right triangle is called the Pythagorean theorem.

The Pythagorean theorem states

$$a^2 + b^2 = c^2$$

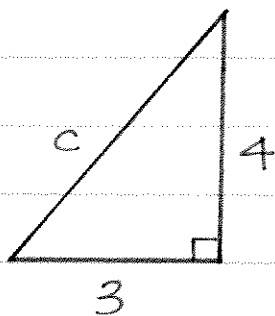


where a and b are legs of the triangle and c is the hypotenuse of the triangle.

↳ example 4:

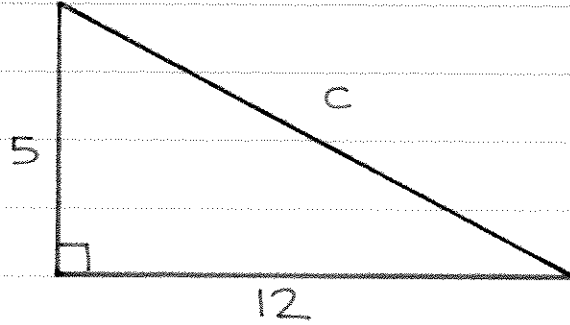
Find the length of the hypotenuse:

a)



$$a^2 + b^2 = c^2$$

b)



$$a^2 + b^2 = c^2$$

SQUARE ROOTS Practice problems

1. a) $\sqrt{81}$
b) $\sqrt{100}$
c) $\sqrt{144}$

2. a) $2\sqrt{9}$
b) $7\sqrt{4}$
c) $\sqrt{16} + \sqrt{25}$

3. $\sqrt{\frac{4}{9}}$

4. Find the hypotenuse:

