

## Unit 1 Review

**Square of a number** - a number squared is a number multiplied by itself.

$3^2$  means 3 squared or 3 to the power of 2

ex:  $4^2 = 4 \times 4 = 16$

ex:  $7^2 = 7 \times 7 = 49$

What is 9 squared?  $9^2 = 9 \times 9 = 81$

What is 12 squared?  $12^2 = 12 \times 12 = 144$



Square Root of a number - What number multiplied by itself will give you the number inside the square root sign?

$\sqrt{64}$  - What number times itself = 64

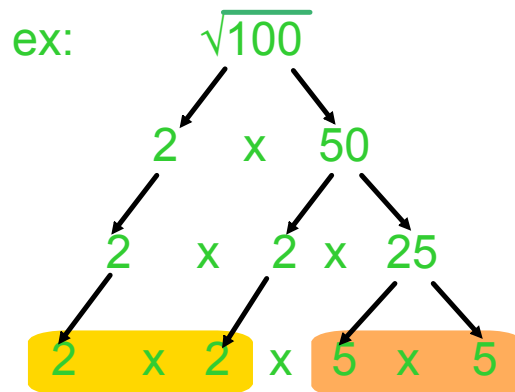
$$\sqrt{64} = 8$$

ex:  $\sqrt{4} = 2$

ex:  $\sqrt{169} = 13$

## Find the square root of a number using prime factorization

Break a number down into prime factors (a number which is only divisible by 1 and itself)



Pair up the prime factors and take 1 from each pair and multiply them to find your square root.

$$\sqrt{100} = 2 \times 5 = 10$$

Find the square roots of each of the following using prime factorization...

A)  $\sqrt{144}$

B)  $\sqrt{81}$

## Find the square root of a number, using factoring

List all the factors of the number in ascending order.

If you have an odd number of factors - you have a perfect square. (the middle number will be the square root of the number)

If you have an even number of factors - you do not have a perfect square. (the middle two numbers will be your square root ie: 6 and 7, square root will be 6.5)

ex:  $\sqrt{81}$  List the factors in ascending order...

1 x 81  
3 x 27  
9 x 9

1, 3, 9, 27, 81

odd number of factors it is a perfect square, 9 is the middle number, 9 is the square root of 81

ex:  $\sqrt{28}$  List the factors in ascending order...

1 x 28  
2 x 14  
4 x 7

1, 2, 4, 7, 14, 28

even number of factors it is not a perfect square, the middle numbers are 4 and 7, 4.5 is the square root of 28

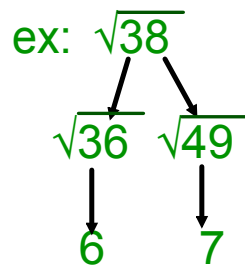
Find the square root of each of the following using factoring...

A)  $\sqrt{48}$

B)  $\sqrt{196}$

## Find the square root of a number using benchmarks...

$\sqrt{38}$  falls between which two perfect squares



Always choose the smaller of the two perfect squares for the number in front of the decimal.

For the number after the decimal - which number is 38 closer to. If closer to the smaller number, choose decimal numbers below 5, if closer to the larger number, choose decimal numbers above 5.

$$6.1^2 = 6.1 \times 6.1 = 37.21 \quad \text{chose \#s below 5 b/c 38 closer to 36}$$
$$6.2^2 = 6.2 \times 6.2 = 38.44$$

$$\therefore \sqrt{38} = 6.1 \quad \text{because } 6.1^2 \text{ is closest to 38, without going over 38}$$

Using benchmarks, find the square root of each of the following

A)  $\sqrt{69}$

B)  $\sqrt{97}$

# Pythagorean Theorem

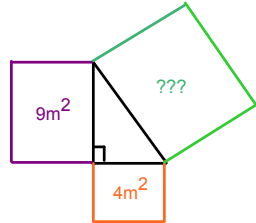
$$a^2 + b^2 = c^2$$

or

$$c^2 - a^2 = b^2$$

or

$$c^2 - b^2 = a^2$$

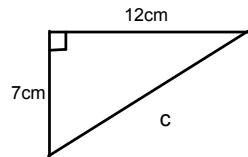
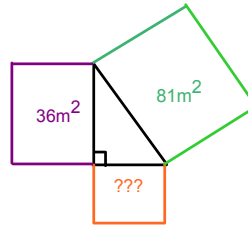


Find the missing measure...

$$9 + 4 = 13m^2$$

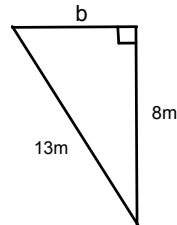
Find the missing measure...

$$81 - 36 = 45m^2$$

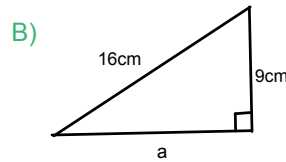
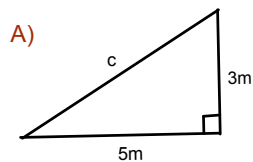


$$\begin{aligned} a^2 + b^2 &= c^2 \\ 12^2 + 7^2 &= c^2 \\ 144 + 49 &= c^2 \\ 193 &= c^2 \\ \sqrt{193} &= c \\ \underline{13.9} &= c \end{aligned}$$

$$\begin{aligned} c^2 - b^2 &= a^2 \\ 13^2 - 8^2 &= a^2 \\ 169 - 64 &= a^2 \\ 105 &= a^2 \\ \sqrt{105} &= a \\ 10.2 &= a \end{aligned}$$



Find the missing measures of each of the following...



Pythagorean Triplets are 3 whole numbers, when you square the sum of the two smaller sides it will equal the square of the larger side (hypotenuse)

ex: 3, 4, 5 
$$\begin{aligned} a^2 + b^2 &= c^2 \\ 3^2 + 4^2 &= 5^2 \\ 9 + 16 &= 25 \\ 25 &= 25 \end{aligned} \therefore 3, 4, \& 5 \text{ is a pythagorean triplet}$$

Which of the following are pythagorean triplets?

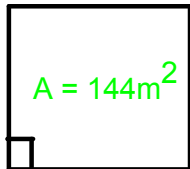
A) 5, 12, 13

B) 8, 9, 11

## Story Problems

1. The area of Ms. Reccord's room is  $144\text{m}^2$ . Brent is going to put crown molding around the ceiling of the room.

- A) How much molding is needed?



The measure of each side is  $\sqrt{144} = 12\text{m}$

$$\begin{aligned} P &= 4(s) \\ &= 4(12) \\ &= 48\text{m} \end{aligned}$$

- B) If the molding cost  $\$8.00/\text{m}$ , how much would it cost to put it up?

$$48 \times 8 = \$384$$

2. Chloe and Jessica saw their friend, Jason, at the opposite end of the soccer field. They placed a bet to see who would get to him the fastest. The field measures  $20\text{m}$  by  $15\text{m}$ . Chloe decided to run two sides of the field, whereas, Jessica decided to run diagonally. Who had to run the farthest? And by how much?

Chloe ----->  $20\text{m} + 15\text{m} = 35\text{m}$

Jessica ----->

$$\begin{aligned} a^2 + b^2 &= c^2 \\ 20^2 + 15^2 &= c^2 \\ 400 + 225 &= c^2 \\ 625 &= c^2 \\ \sqrt{625} &= c \\ c &= 25\text{m} \end{aligned}$$

Jessica got there the fastest.

$$35 - 25 = 10\text{m}$$

