Curriculum Outcome

(N5) Determine the square root of positive rational numbers that are perfect squares.

(N6) Determine an approximate square root of positive rational numbers that are non-perfect squares.

(SS2) Determine the surface area of composite 3-D objects to solve problems

(N4) **Explain and apply the order of operations, including exponents, with and without technology.**

Warm Up Math 9

Without a calculator

1) Find the perfect square whose square root is

a) 0.6 $(\sqrt{x})^2 = (0.6)^2$ $x = 0.36$ $\left(\frac{6}{10}\right)^2 = \frac{36}{100}$

b) $\frac{3}{5}$ $\sqrt{x} = \frac{3}{5}$ $x = \frac{9}{25}$

2) Is the following fractions or decimals perfect squares? Explain

a) 0.64 $\sqrt{\frac{64}{100}}$ $\frac{8}{10}$ P.S

b) 62.5 $\sqrt{\frac{625}{10}}$ $\frac{25}{?}$ Not P.S

c) $\sqrt{\frac{49}{144}}$ $\frac{7}{12}$ P.S

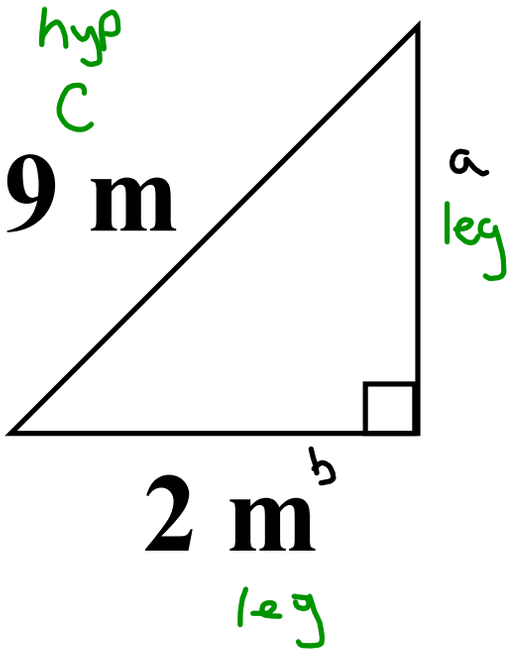
d) $\sqrt{\frac{13}{25}}$ $\frac{?}{5}$ Not P.S

THE FIRST 25 PERFECT SQUARES:

1^2	= 1 x 1	=	11^2	= 11 x 11	=
2^2	= 2 x 2	=	12^2	= 12 x 12	=
3^2	= 3 x 3	=	13^2	= 13 x 13	=
4^2	= 4 x 4	=	14^2	= 14 x 14	=
5^2	= 5 x 5	=	15^2	= 15 x 15	=
6^2	= 6 x 6	=	16^2	= 16 x 16	=
7^2	= 7 x 7	=	17^2	= 17 x 17	=
8^2	= 8 x 8	=	18^2	= 18 x 18	=
9^2	= 9 x 9	=	19^2	= 19 x 19	=
10^2	= 10 x 10	=	20^2	= 20 x 20	=

1)+3
4)+5
9)+7
16)+9
25)+11
36)+13
49)+
64

19^2 361)+39
$20^2 = 400$)+41



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

$a^2 + 2^2 = 9^2$

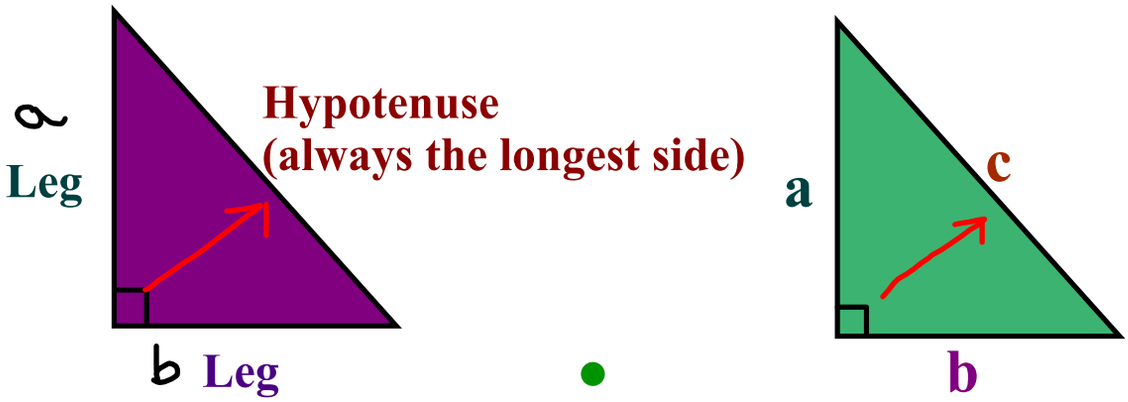
$a^2 + 4 - 4 = 81 - 4$

$\sqrt{a^2} = \sqrt{77}$

$a \doteq 8.77$

PYTHAGOREAN THEOREM:

We know that a right triangle is a triangle containing a 90° angle.



Hypotenuse

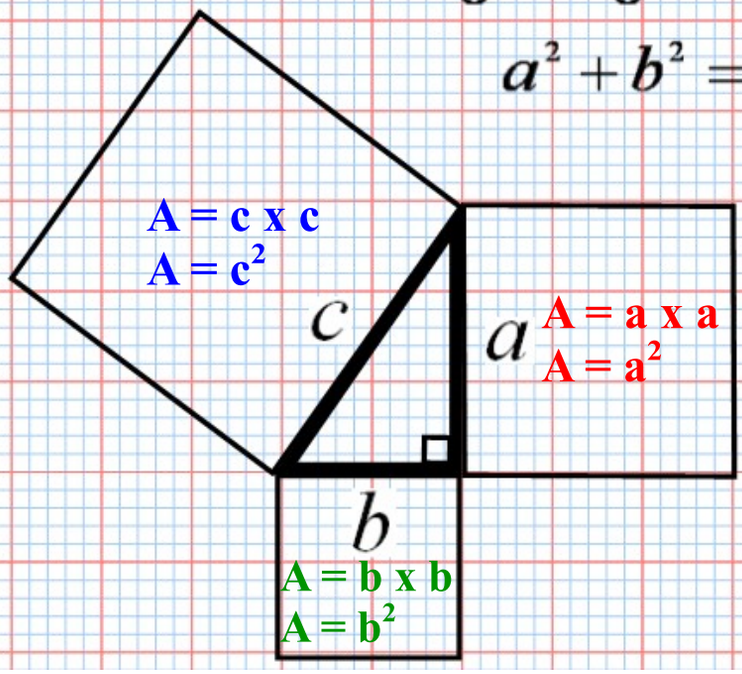
$$c^2 = a^2 + b^2$$

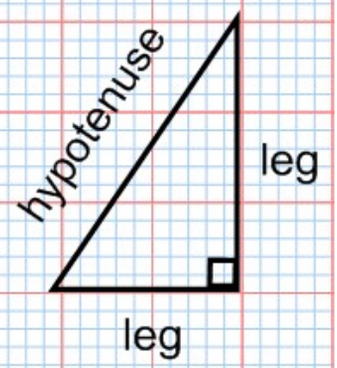
Leg

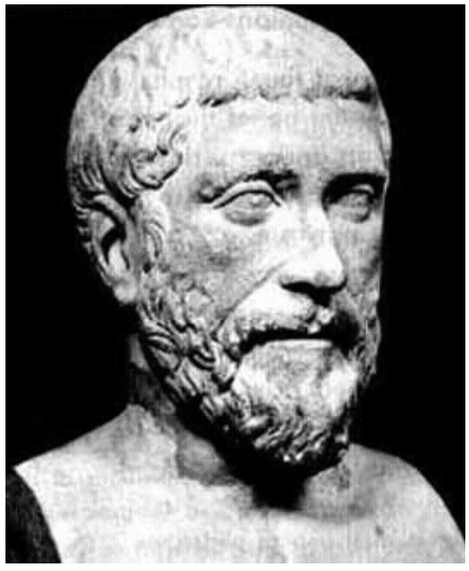
$$b^2 = c^2 - a^2$$

Pythagoras found out that when you have a right triangle, $leg^2 + leg^2 = hypotenuse^2$

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



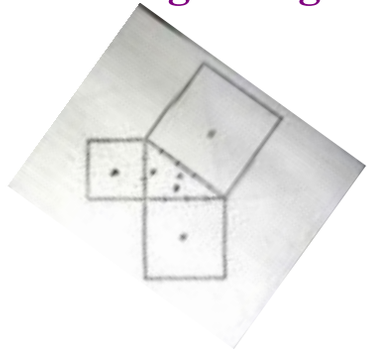


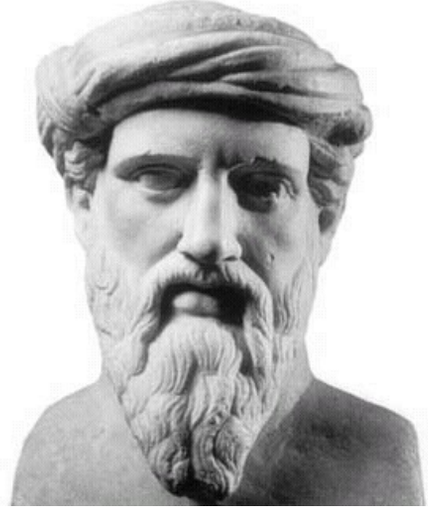


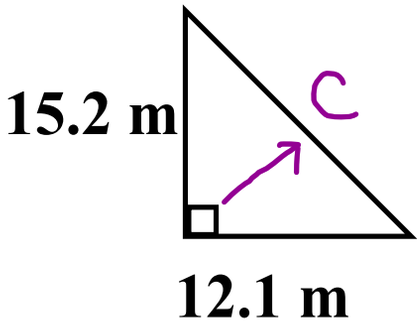
Pythagoras of Samos
(about 569 BC - about 475 BC)

Pythagoras was a Greek philosopher who made important developments in mathematics, astronomy and the theory of music. The theorem now known as Pythagoras' theorem was known to the Babylonians 1000 years earlier, but he may have been the first to prove it.

Pythagoras discovered a relationship between the areas of the squares drawn on the sides of a right-angled triangle.







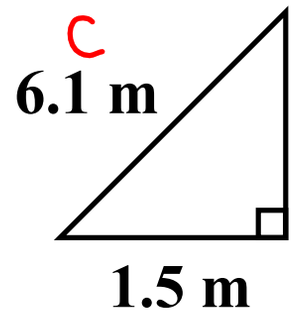
$C^2=a^2+b^2$

$c^2=15.2^2+12.1^2$

$c^2=231.04+146.41$

$\sqrt{c^2}=\sqrt{377.45}$

$c=19.43$



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

$a^2=6.1^2-1.5^2$

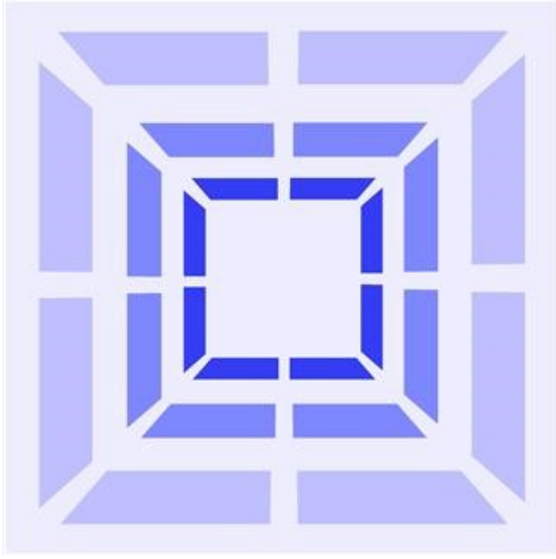
$a^2=37.21-2.25$

$a^2=34.96$

$a=5.9$

Section 1.2

Square Roots of Non-Perfect Squares



Perfect Squares...

16

25

9

1

4

144

256

Non-Perfect Squares...

15

8

2

11

20

167

19

$\sqrt{16} = 4$

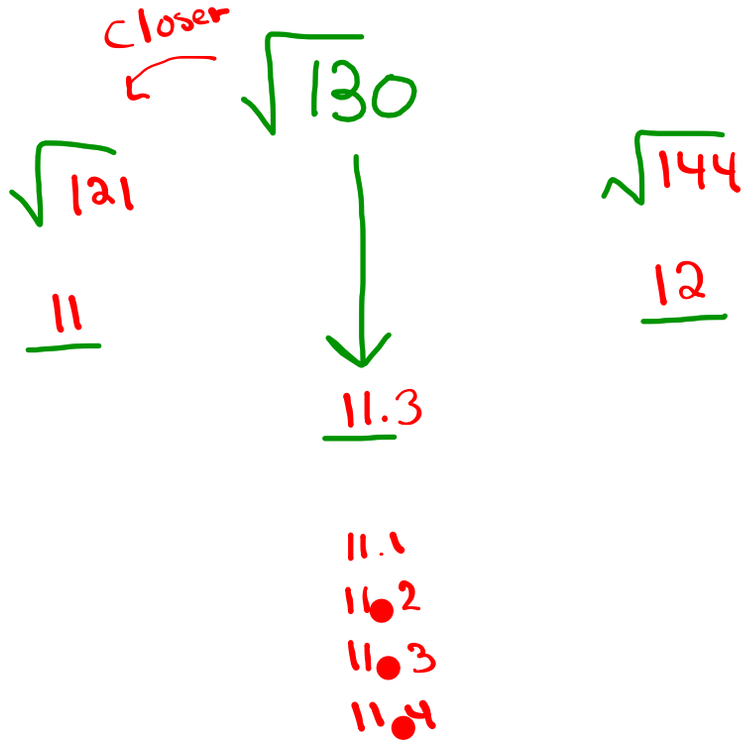
$\sqrt{8} = 2.8284271\ldots$

Non- perfect Squares cannot be written as a product of two equal numbers

Estimate the square root of 7.5.

With Calculator:	Without Calculator:
$\sqrt{7.5} \doteq 2.7$	Using Benchmarks: $\sqrt{7.5}$ closer to $\sqrt{9}$ than $\sqrt{4}$ $\sqrt{4}$ $\sqrt{9}$ 2 3 2.6 2.7 2.8 2.9

Estimate the square root of 130



Estimate the square root of $\frac{3}{7}$.

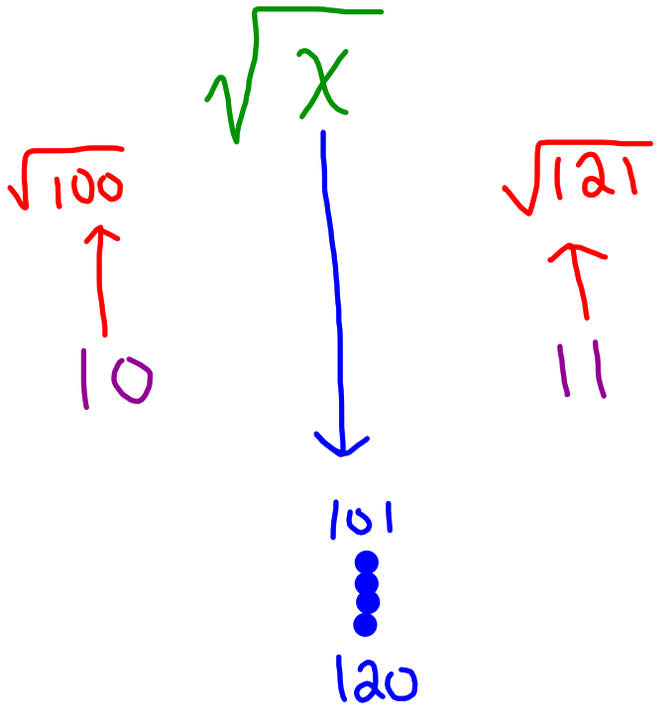
With Calculator:	Without Calculator:
$\sqrt{(3 \div 7)} \doteq 0.65$	$\sqrt{\frac{3}{7}} \doteq \sqrt{\frac{4}{9}} = \frac{2}{3}$ $0.\overline{6}$

Without Calculator

Estimate the square root of $\frac{17}{63}$.

$\sqrt{\frac{17}{63}} \doteq$

Find a number that has a square root between 10 and 11.



Please Complete
Questions
Pages
18 and 19.

4) a,c,e without
5) a,c,e without

ENJOY!

7) a, c, e without
9)a, c
10) a, c,e
11) a,b
12)a c
13) ac
15 (Estimate first then answer the question *Show work*)
19 a c