

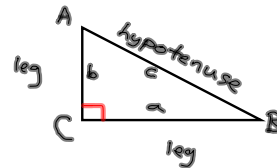
# Algebra I

## 11-6

### Pythagorean Theorem

What is a right triangle? A triangle with a  $90^\circ$  angle.

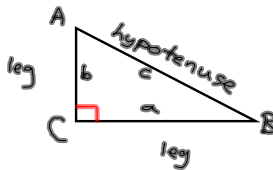
Label the parts of a right triangle.



### Equation of Utmost Importance #2

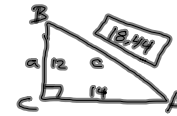
Pythagorean Theorem - The sum of the squares of the legs of a right triangle is equal to the square of the hypotenuse

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



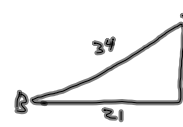
Find the missing length to the nearest hundredth. (pg. 532)

\*1)  $a = 12$ ,  $b = 14$ ,  $c = ?$



$$\begin{aligned} a^2 + b^2 &= c^2 \\ 12^2 + 14^2 &= c^2 \\ 144 + 196 &= c^2 \\ \sqrt{340} &= \sqrt{c^2} \\ 18.44 &= |c| \end{aligned}$$

\*2)  $a = 21$ ,  $b = ?$ ,  $c = 34$



$$\begin{aligned} a^2 + b^2 &= c^2 \\ (21)^2 + b^2 &= (34)^2 \\ -441 + 441 + b^2 &= 1156 - 441 \\ \sqrt{b^2} &= \sqrt{715} \quad b = 26.74 \end{aligned}$$

State whether the three numbers given could represent the sides of a right triangle.

11)  $a = 20$ ,  $b = 21$ ,  $c = 29$  (c is longest)

$$\begin{aligned} a^2 + b^2 &= c^2 \\ (20)^2 + (21)^2 &= (29)^2 \\ 400 + 441 &= 841 \\ 841 &= 841 \\ \text{Yes!} \end{aligned}$$

17)  $2a$ ,  $3a$ ,  $4a$  (c is longest)

$$\begin{aligned} a^2 + b^2 &= c^2 \\ (2a)^2 + (3a)^2 &= (4a)^2 \\ 4a^2 + 9a^2 &= 16a^2 \\ 13a^2 &= 16a^2 \\ \text{No!} \end{aligned}$$

Find the missing length to the nearest hundredth.

23)  $a = 18$ ,  $b = \frac{1}{3}a$ ,  $c = ?$

$$\begin{aligned} b &= \frac{1}{3}(18) \\ b &= 6 \end{aligned}$$

$$\begin{aligned} a^2 + b^2 &= c^2 \\ (18)^2 + (6)^2 &= c^2 \\ 324 + 36 &= c^2 \\ \sqrt{360} &= \sqrt{c^2} \\ 18.97 &= |c| \\ 18.97 & \end{aligned}$$

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1-10 all

12-30 even