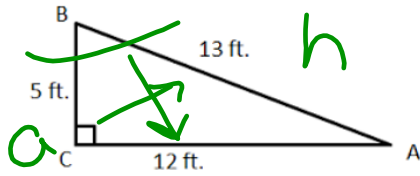


Lesson 9.2- SWBAT find the missing side of a right triangle

Kick off-

1) Find $\sin B$, $\cos B$, $\tan B$ for the following triangle.



$$S = \frac{O}{H} \rightarrow \sin B = \frac{12}{13}$$

$$C = \frac{A}{H} \quad \cos B = \frac{5}{13}$$

$$T = \frac{O}{A} \quad \tan B = \frac{12}{5}$$

2) Simplify: $\sqrt{27} + \sqrt{12} - \sqrt{72}$

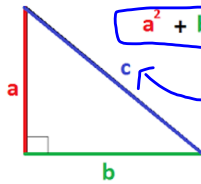
$$\sqrt{9} \sqrt{3} + \sqrt{4} \sqrt{3} - \sqrt{36} \sqrt{2}$$

$$3\sqrt{3} + 2\sqrt{3} - 6\sqrt{2}$$

$$5\sqrt{3} - 6\sqrt{2}$$

Pythagorean Theorem

Use this when you have 2 sides and you are finding a side.

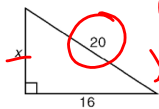


$$a^2 + b^2 = c^2$$

*must be the hypotenuse

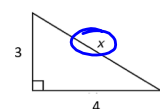
Examples: Solve for the missing side on each of the following triangles. Round to the nearest integer.

1)



$$\begin{aligned} a^2 + b^2 &= c^2 \\ x^2 + 16^2 &= 20^2 \\ x^2 + 256 &= 400 \\ -256 &-256 \\ \hline x^2 &= 144 \\ \sqrt{x^2} &= \sqrt{144} \\ x &= 12 \end{aligned}$$

2)



$$\begin{aligned} a^2 + b^2 &= c^2 \\ 4^2 + 3^2 &= x^2 \\ 16 + 9 &= x^2 \\ \sqrt{25} &= \sqrt{x^2} \\ 5 &= x \end{aligned}$$

Trigonometric Ratios

Use this when you have 1 side and 1 angle given.

$\sin \theta = \frac{O}{h}$ $\cos \theta = \frac{A}{H}$ $\tan \theta = \frac{O}{A}$

*When x is high \rightarrow multiply. (numerator)
 *When x is low \rightarrow divide. (denominator)

Examples:
 Directions: Solve for the missing sides. Round to the nearest tenth.

1) $\tan 27^\circ = \frac{x}{10}$
 $10(\tan 27)$
 5.0952
 $\boxed{5.1}$

2) $\cos 39^\circ = \frac{x}{7}$
 $7 \cos 39$
 $5.440 \rightarrow \boxed{5.4}$

1 decimal place.

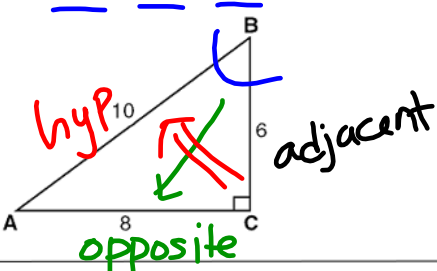
3) $\sin 46^\circ = \frac{8}{x}$
 $\frac{8}{\sin 46} = 11.12$
 $\boxed{11.1}$

4) $\tan 72^\circ = \frac{x}{20}$
 $20(\tan 72^\circ)$
 $\boxed{61.6}$

Lesson 9.2- SWBAT find the missing side of a right triangle. (Day 2)

Kick off-

1) Find $\sin B$, $\cos B$, $\tan B$ for the following triangle.



SOH CAH TOA

$\sin = \frac{\text{opp}}{\text{hyp}} = \frac{8}{10} = \frac{4}{5}$

$\cos = \frac{\text{adj}}{\text{hyp}} = \frac{6}{10} = \frac{3}{5}$

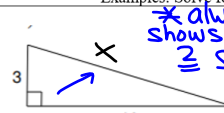
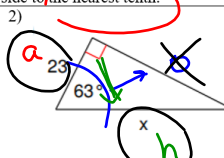
$\tan = \frac{\text{opp}}{\text{adj.}} = \frac{8}{6} = \frac{4}{3}$

2) Simplify: $\sqrt{24} + \sqrt{18} - \sqrt{54}$

$\sqrt{4 \cdot 6} + \sqrt{9 \cdot 2} - \sqrt{9 \cdot 6}$
 $2\sqrt{6} + 3\sqrt{2} - 3\sqrt{6}$
 $-1\sqrt{6} + 3\sqrt{2}$

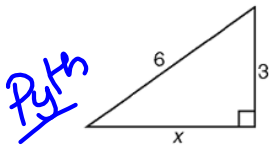
4 ~ 2.2
9 ~ 3.3
16 ~ 4.4
25
36
49
64
81
100

Methods to Solve for Sides

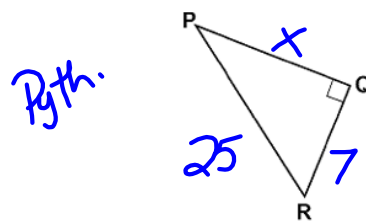
Pythagorean Theorem	Trigonometric Ratios
<p>$a^2 + b^2 = c^2$</p> <p>$c^2 = \text{hypotenuse}^2$</p> <p>$\text{leg}^2 + \text{leg}^2 = \text{hypotenuse}^2$</p> <p><i>* always shows \cong sides</i></p>	<p style="text-align: center;">SOH CAH TOA</p> <p>$\sin = \frac{\text{opp}}{\text{hyp}}$ $\tan = \frac{\text{opp}}{\text{adj}}$</p> <p>$\cos = \frac{\text{adj}}{\text{hyp}}$ <i>* degrees always</i></p>
Examples: Solve for the missing side to the nearest tenth.	
<p>1) </p> <p>$a^2 + b^2 = c^2$ $3^2 + 10^2 = x^2$ $9 + 100 = x^2$ $\sqrt{109} = \sqrt{x^2}$ $x = 10.4$ $x = 10.44$</p>	<p>2) </p> <p style="text-align: center;">SOH CAH TOA</p> <p>$\cos 63 = \frac{23}{x}$</p> <p>$x \cos 63 = 23$ $\frac{x \cos 63}{\cos 63} = \frac{23}{\cos 63}$</p> <p>$x = 50.66$ $x = 50.7$</p>

Directions: For each of the following, find the missing sides. Round your answer to the nearest tenth.

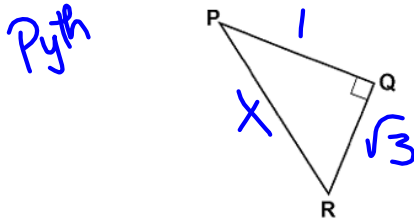
1)



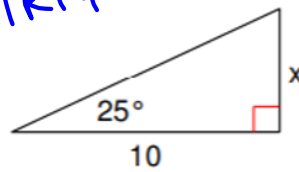
2) Find the length of PQ if QR is 7 and PR is 25.



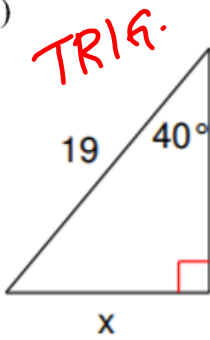
3) Find the length of the hypotenuse if the two legs are 1 and $\sqrt{3}$.



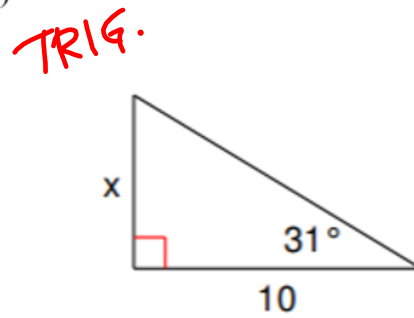
4) *TRIG*



5)

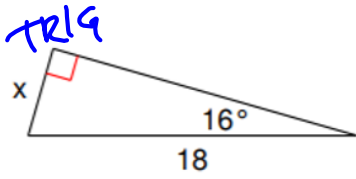


6)

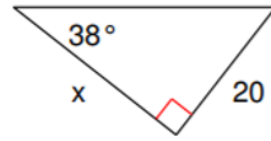


Directions: Solve for the missing side to the nearest tenth.

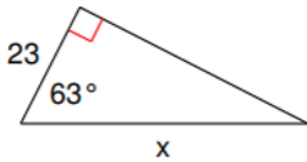
8)



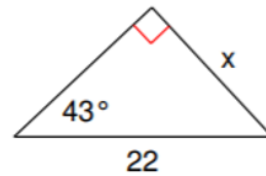
9) TRIG.



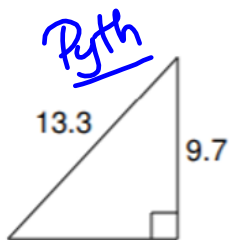
10) TRIG.



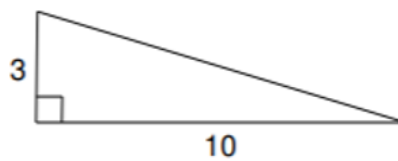
11) TRIG.



12)



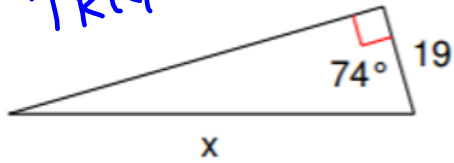
13) Pyth.



Directions: Solve for the missing side to the nearest tenth.

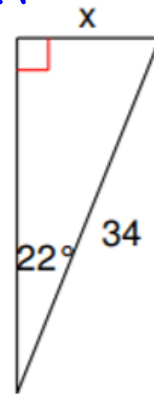
14)

TRIG.

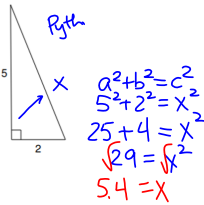


15)

TRIG.

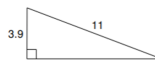


16)

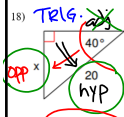


Pyth
 $a^2 + b^2 = c^2$
 $5^2 + 2^2 = x^2$
 $25 + 4 = x^2$
 $29 = x^2$
 $\sqrt{29} = \sqrt{x^2}$
 $5.4 = x$

Pyth



18)



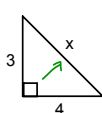
SOH
CAH
TOA

~~$\sin 40 = \frac{x}{20}$~~

$x = 20 \sin 40$
 $12.85 \rightarrow x = 12.9$

Exit pass: Solve for the missing side of each triangle. Round to the nearest tenth.

1)



$a^2 + b^2 = c^2$
 $3^2 + 4^2 = x^2$
 $9 + 16 = x^2$
 $25 = x^2$
 $\sqrt{25} = \sqrt{x^2}$

$x = 5$

* Sides given!



SOH
CAH
TOA

$\cos 39 = \frac{x}{7}$

$1x = 7 \cos 39$

$x = 5.4$

* degrees