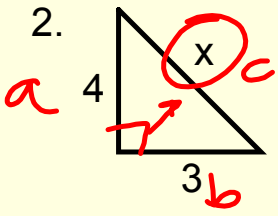
Warm Up

1. What is the formula for Pythagorean Theorem?

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

Solve using the Pythagorean Theorem.

2.



a b c

$4^2 + 3^2 = x^2$

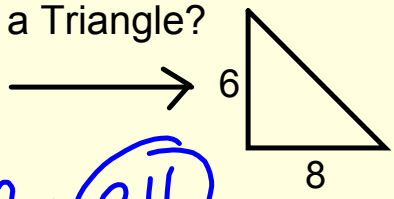
$16 + 9 = x^2$

$\sqrt{25} = \sqrt{x^2}$

$5 = x$

3. What is the formula for the area of a Triangle?

Find the area of the triangle.



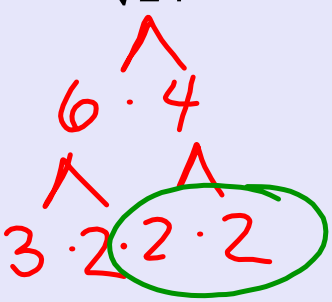
$A = \frac{b \cdot h}{2}$

$A = \frac{1}{2} \cdot b \cdot h$

$\frac{8 \cdot 6}{2} = 24$

Page 2: Review of Radicals

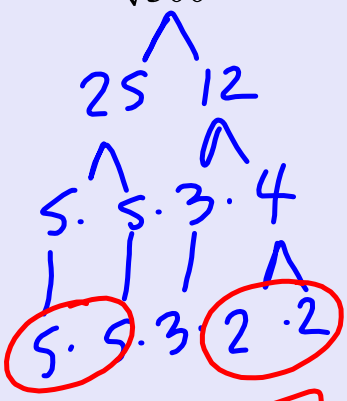
$\sqrt{24}$



$2\sqrt{3 \cdot 2}$

$2\sqrt{6}$

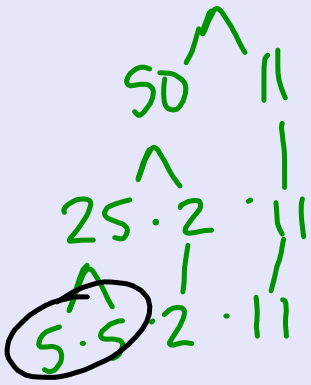
$\sqrt{300}$



$5 \cdot 2\sqrt{3}$

$10\sqrt{3}$

$\sqrt{550}$



$5\sqrt{2 \cdot 11}$

$5\sqrt{22}$

Pythagorean Theorem

ONLY WORKS FOR right triangles

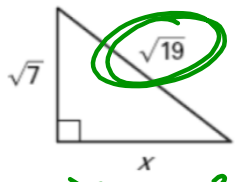
The Pythagorean Theorem says…

a^2 + b^2 = c^2

There are two ways to use this.....

1. Find the missing side.

Find the unknown side lengths. Simplify radical answers.

7) 

$(\sqrt{7})^2 + x^2 = (\sqrt{19})^2$

$7 + x^2 = 19$

$-7 \quad -7$

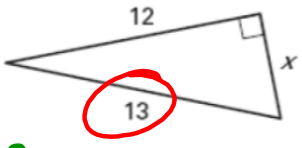
$\sqrt{x^2} = \sqrt{12}$

$x = \sqrt{12}$

$6 \cdot 2$

$3 \cdot 2 \cdot 2$

$x = 2\sqrt{3}$

8) 

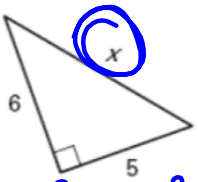
$x^2 + 12^2 = 13^2$

$x^2 + 144 = 169$

$-144 \quad -144$

$x^2 = 25$

$x = 5$

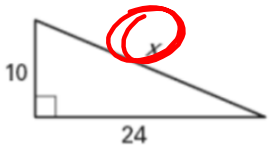
9) 

$6^2 + 5^2 = x^2$

$36 + 25 = x^2$

$61 = x^2$

$\sqrt{61} = x$

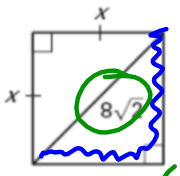
10) 

$10^2 + 24^2 = x^2$

$100 + 576 = x^2$

$676 = x^2$

$26 = x$

11) 

$x^2 + x^2 = (8\sqrt{2})^2$

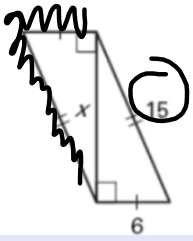
$x^2 + x^2 = 8^2 \cdot (\sqrt{2})^2$

$2x^2 = 64 \cdot 2$

$\frac{2x^2}{2} = \frac{128}{2}$

$x^2 = 64$

$x = 8$

12) 

$x^2 + 6^2 = 15^2$

$x^2 + 36 = 225$

$x^2 = 189$

$63 \quad 3$

$21 \cdot 3 \quad \cdot 3$

$7 \cdot 3 \quad 3 \cdot 3$

$3\sqrt{21}$

Page 3

2. Determine whether or not it is a right triangle.

If c^2 is equal to $a^2 + b^2$, right triangle

If c^2 is greater than $a^2 + b^2$, obtuse triangle

If c^2 is less than $a^2 + b^2$, acute triangle

Classify the triangle as right, acute or obtuse.

1. 5, 12, (13)

$5^2 + 12^2 = 13^2$

$25 + 144 = 169$

$169 = 169$

right

2. 20, 21, (28)

$20^2 + 21^2 = 28^2$

$400 + 441 = 784$

$841 \neq 784$

acute

3. 14, 48, (52)

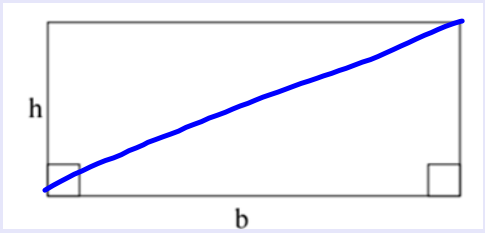
$14^2 + 48^2 = 52^2$

$196 + 2304 = 2704$

$2500 \neq 2704$

obtuse

Area of a Triangle

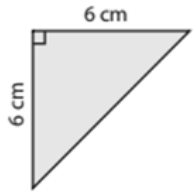


1. What is the area of a rectangle? $b \cdot h$
2. Draw a diagonal in your rectangle.
3. How do your triangles compare to the rectangle? half
4. So what is the area of your triangle?

$A = \frac{b \cdot h}{2}$ OR $A = \frac{1}{2} \cdot b \cdot h$

Find the area of each triangle.

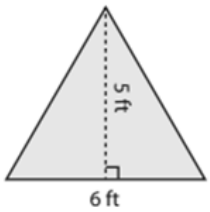
1)



Area = 18 cm²

$\frac{6 \cdot 6}{2}$

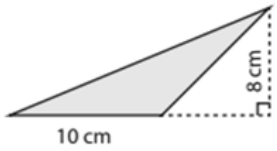
2)



Area = 15 ft²

$\frac{6 \cdot 5}{2}$

3)



Area = 40 cm²

$\frac{10 \cdot 8}{2}$

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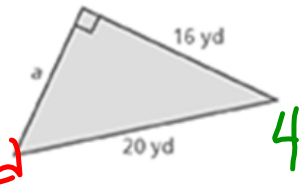
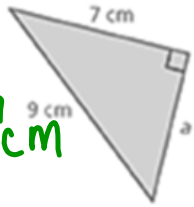
Find the missing length of the triangle.

2 **3.**



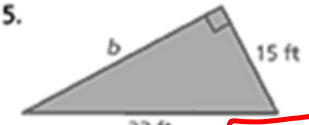
12 yd

4.



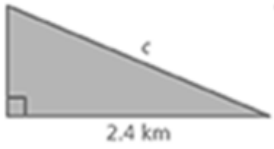
$4\sqrt{2}$ cm

5.



$\sqrt{799}$ ft

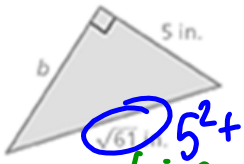
6.



decimal

2.6 km

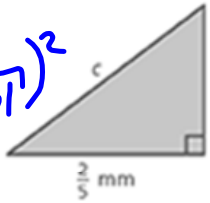
7.



$5^2+b^2=(\sqrt{61})^2$

6 in

8.



$\frac{1}{2}$ mm

fraction

9. ERROR ANALYSIS Describe and correct the error in finding the missing length of the triangle.

X hyp

$x^2+6^2=20^2$

$x=\sqrt{364}$

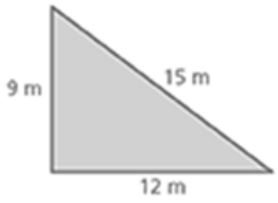
$x=2\sqrt{91}$

10. TRIPOD The center of the tripod forms a 90° angle with the ground. Find the length of the support leg to the nearest tenth of an inch.

$6\sqrt{73}=\sqrt{2628}$

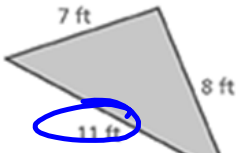
Tell whether the triangle with the given side lengths is a right triangle.

1 **5.**



yes

6.



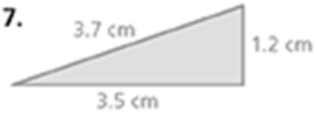
no, obtuse

$7^2+8^2 \stackrel{?}{=} 11^2$

$49+64=121$

$113=121$

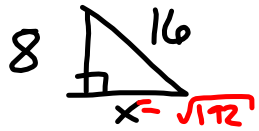
7.



yes

Find the area of a right triangle with the given leg (L) and hypotenuse (H). Round your answers to the nearest tenth.

22) $\ell = 8\text{ m},\ h = 16\text{ m}$



$x^2 + 8^2 = 16^2$

$x^2 = 192$

$x = \sqrt{192}$

$\frac{\sqrt{192} \cdot 8}{2} = 55.4\text{m}^2$

23) $\ell = 9\text{ yd},\ h = 12\text{ yd}$

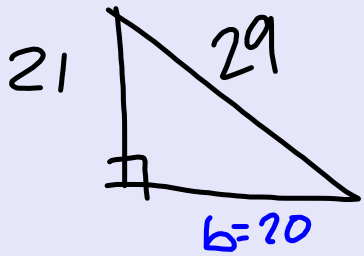
$b = \sqrt{63}$ yd

$A = 35.7\text{ yd}^2$

24) $\ell = 21\text{ in},\ h = 29\text{ in}$

$b = 20$ in

$A = 210\text{ in}^2$



$b^2 + 21^2 = 29^2$

$b^2 = 400$

$b = 20$

$A = \frac{21 \cdot 20}{2} = 210$

25) $\ell = 13\text{ cm},\ h = 17\text{ cm}$

$b = \sqrt{120}$ cm

$A = 71.2\text{ cm}^2$