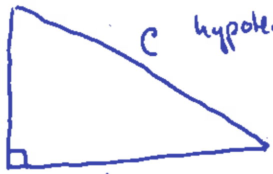
Geometry – Mr. Bo
Unit 7 – Day 5 Notes

Name:____________________________
Date: ____________

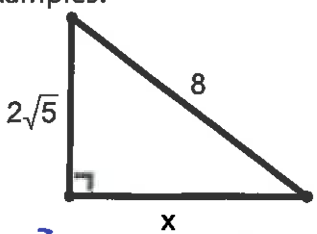
Pythagorean Theorem: for Right Δ's only!



$\boxed{a^2+b^2=c^2}$

Examples:

1.



$x^2+(2\sqrt{5})^2=8^2$

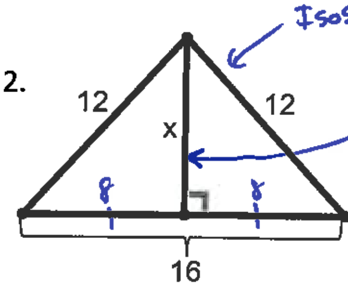
$x^2+20=64$

$x^2=44$

$x=\sqrt{44}$

$\boxed{=2\sqrt{11}}$

2.



Isosceles Δ.

altitude = median in an isosceles Δ.

$8^2+x^2=12^2$

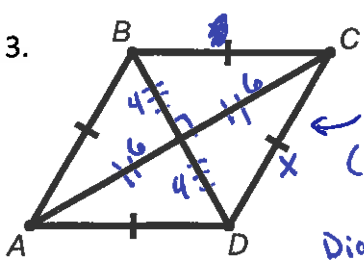
$64+x^2=144$

$x^2=80$

$x=\sqrt{80}$

$\boxed{=4\sqrt{5}}$

3.



Rhombus ($4 \cong$ sides)

Diagonals are ⊥.

Diagonals bisect eachother

AC = 12

BD = 8

Find CD.

$4^2+6^2=x^2$

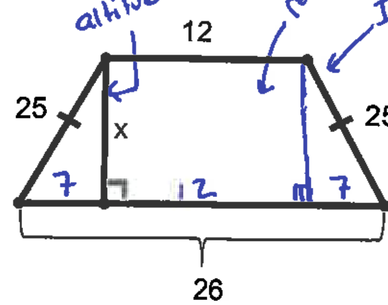
$16+36=x^2$

$52=x^2$

$x=\sqrt{52}$

$\boxed{=2\sqrt{13}}$

4.



altitude.

rectangle

Isosc. trap.

$26-12=14$

$14 \div 2=7$

$x^2+7^2=25^2$

$x^2+49=625$

$x^2=576$

$x=\sqrt{576}$

$\boxed{=24}$

Pythagorean Theorem Converse: If $a^2+b^2=c^2$, then the Δ is a Right Δ.

Acute Triangle	Right Triangle	Obtuse Triangle
$c^2 < a^2+b^2$	$c^2 = a^2+b^2$	$c^2 > a^2+b^2$

Examples: Determine if the triangle is Right, Acute, or Obtuse.

1. {6, 10, 18}

$6^2+10^2 = 136$

$18^2 = 324$

$a^2+b^2 < c^2$

$136 < 324$

so, obtuse Δ.

2. {6, $\sqrt{8}$, $2\sqrt{11}$}

$6^2+(\sqrt{8})^2 = 36+8 = 44$

$(2\sqrt{11})^2 = 4 \cdot 11 = 44$

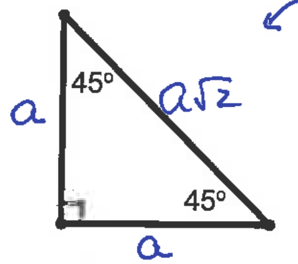
$c^2 = a^2+b^2$

so, Right Δ.

Special Right Triangles

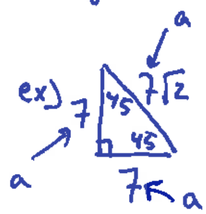
note: Can only use when angle measures are known!

45-45-90 Triangle



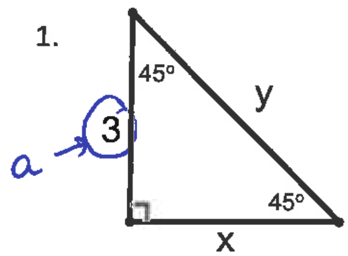
½ of a square.

ex)



Examples: Find x and y in simplest radical form.

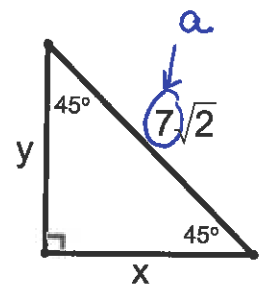
1.



$x = 3$

$y = 3\sqrt{2}$

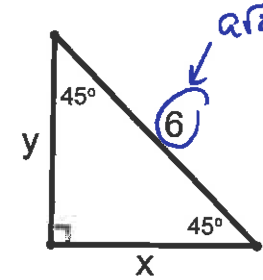
2.



$y = 7$

$x = 7$

3.



$a\sqrt{2} = 6$

$a = \frac{6}{\sqrt{2}}$

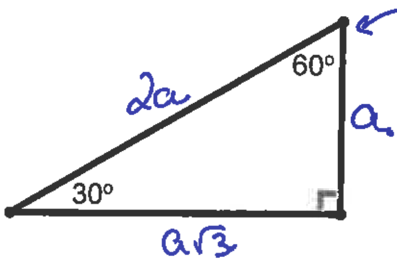
$= \frac{6\sqrt{2}}{2}$

$a = 3\sqrt{2}$

$y = 3\sqrt{2}$

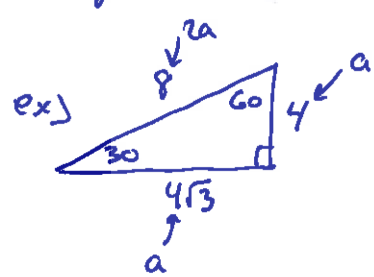
$x = 3\sqrt{2}$

30-60-90 Triangle



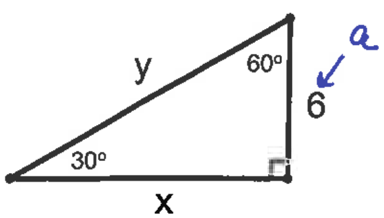
½ of an equilateral △.

ex)



Examples: Find x and y, in simplest radical form.

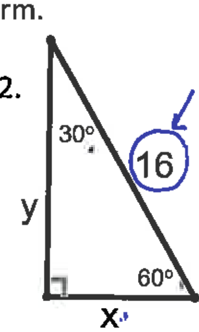
1.



$y = 2(6) = 12$

$x = 6\sqrt{3}$

2.



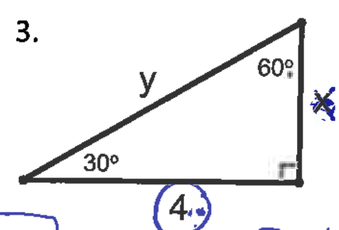
$2a = 16$

$a = 8$

$x = \frac{16}{2} = 8$

$y = 8\sqrt{3}$

3.



$a\sqrt{3} = 4$

$a = \frac{4}{\sqrt{3}}$

$= \frac{4\sqrt{3}}{3} = \frac{4}{3}\sqrt{3}$

$\boxed{x = \frac{4}{3}\sqrt{3}}$

$y = 2\left(\frac{4}{3}\sqrt{3}\right) = \boxed{\frac{8}{3}\sqrt{3}}$