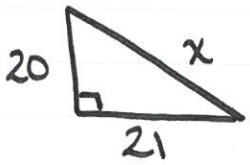
5.1 The Pythagorean Thm and its Converse

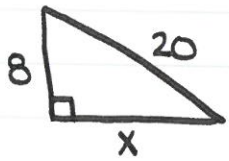
Unit 5
Day 1

Pythagorean Theorem: If a triangle is a right triangle with hypotenuse = c & legs = a & b, then $a^2 + b^2 = c^2$.

Pythagorean Triples: 3,4,5 5,12,13 8,15,17 7,24,25 etc

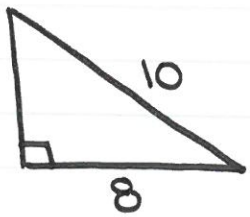
examples using pyth. thm: *leave in radical form*





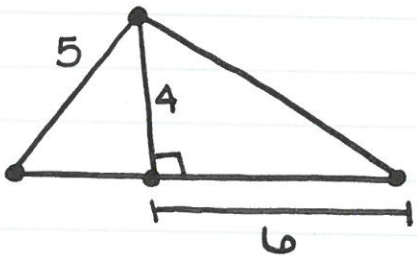
Area: In a triangle, Area = $\frac{1}{2} \cdot b \cdot h$
where b = base h = height
(base & height are ⊥.)

ex.



Area = _____

ex:



Area = _____

Converse of the Pyth. Theorem

If the square of the length of one side of a △ equals the sum of the squares of the other two sides, then the △ is a right △.

extensions...

If $c^2 = a^2 + b^2$ then right △

If $c^2 > a^2 + b^2$ then obtuse △

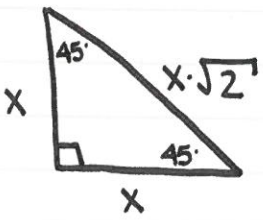
If $c^2 < a^2 + b^2$ then acute △.

5.2 Special Right △'s

Unit 5 Day 2

Rules

45-45-90

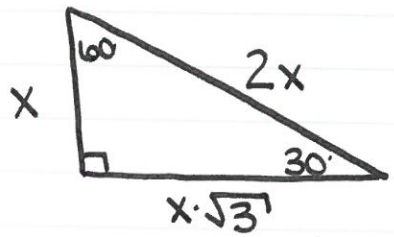


legs are congruent

leg·$\sqrt{2}$ = hypotenuse

↥ "Isosceles Right △"

30-60-90

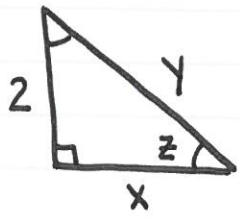


x = short side

x$\sqrt{3}$ = long side

x·2 = hypotenuse

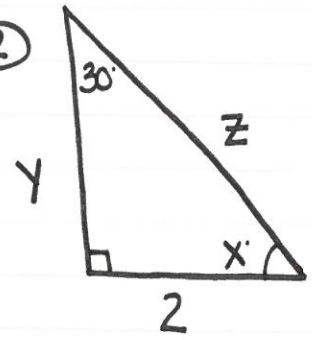
ex: Solve for x, y, z, etc ☺.

① 

x = 2

y = $2\sqrt{2}$

z = 45

② 

$x = 60$
$y = 2\cdot\sqrt{3}$
$z = 4$

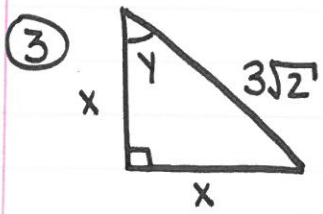
Rationalizing Denominator

*Side note:

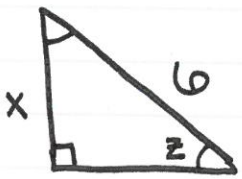
$$\frac{5}{\sqrt{2}} = \frac{5}{\sqrt{2}}\cdot\frac{\sqrt{2}}{\sqrt{2}}$$

$$= \frac{5\sqrt{2}}{\sqrt{4}}$$

$$= \frac{5\sqrt{2}}{2}$$

③ 

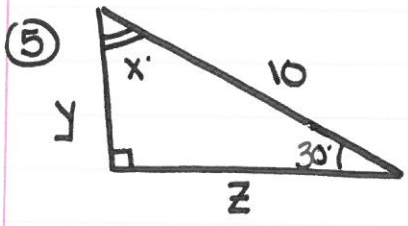
$x = 3$
$y = 45$

④ 

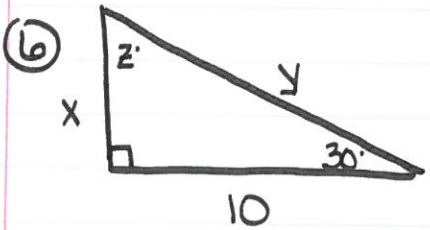
$x\cdot\sqrt{2} = 6$

$x = \frac{6}{\sqrt{2}} = \frac{6\sqrt{2}}{\sqrt{2}\cdot\sqrt{2}} =$ **$3\sqrt{2} = x$**

$z = 45$

⑤ 

$x = 60$ $\quad y\cdot 2 = 10$, $y = 5$ $\quad z = 5\sqrt{3}$

⑥ 

$z = 60$ $\quad x\cdot\sqrt{3} = 10$, $x = \frac{10}{\sqrt{3}}\cdot\frac{\sqrt{3}}{\sqrt{3}}$, $x = \frac{10\sqrt{3}}{3}$ $\quad y = \frac{20\sqrt{3}}{3}$