10-2 Classifying Triangles and Pythagorean Theorem

I can classify a triangle using the correct vocabulary:

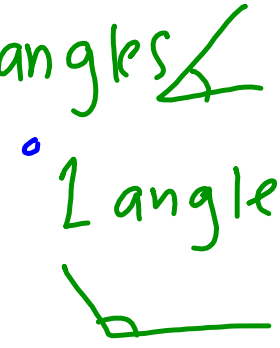
angles, sides

I can use the Pythagorean Theorem to find a missing side of a right triangle.

Vocabulary

angles

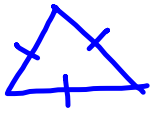
- acute: less than 90° all angles
- obtuse: greater than 90° 1 angle
- right: exactly 90°



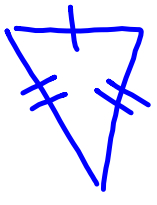
Side

- scalene: no sides same length

- equilateral: all sides same



- Isosceles: 2 sides same



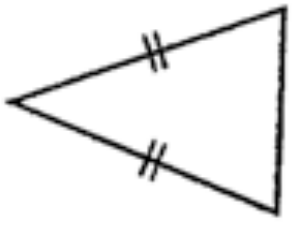
A triangle is classified by its sides and by its angles.

Classification by Sides

Equilateral Triangle

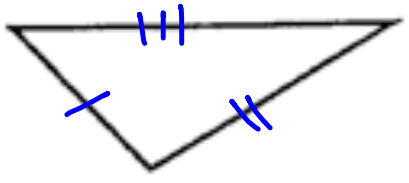
3 congruent sides

Isosceles Triangle



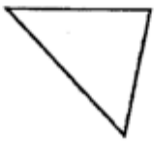
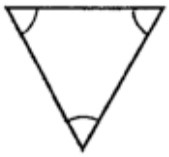
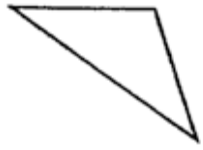
At least 2 congruent sides

Scalene Triangle



No congruent sides

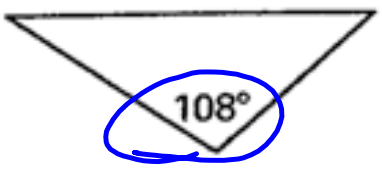
Classification by Angles

Acute Triangle	Equiangular Triangle	Right Triangle	Obtuse Triangle
			
3 acute angles	3 congruent angles	1 right angle	1 obtuse angle

Note: An equiangular triangle is also acute, but it is more specific to called it equiangular.

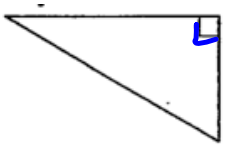
Classify the triangle by its angles and by its sides.

a.



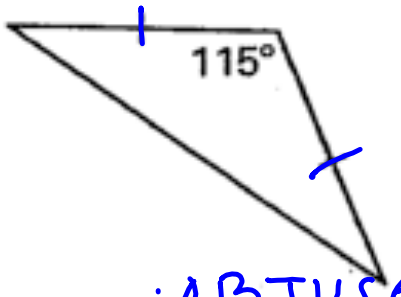
· OBTUSE
· Scalene

b.



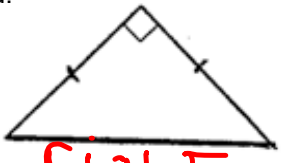
· RIGHT
· Scalene

c.



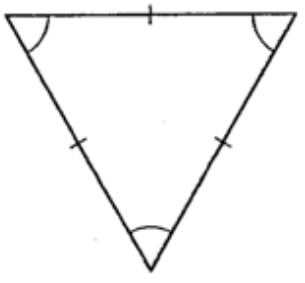
· OBTUSE
· ISOSCELES

d.



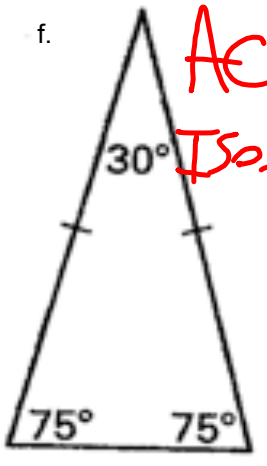
RIGHT
ISOSCELES

e. equilateral



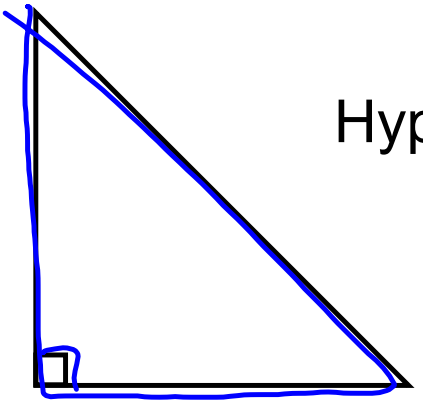
equiangular
acute

f. ACUTE



Isosceles

Right Triangle



Hypotenuse

Leg

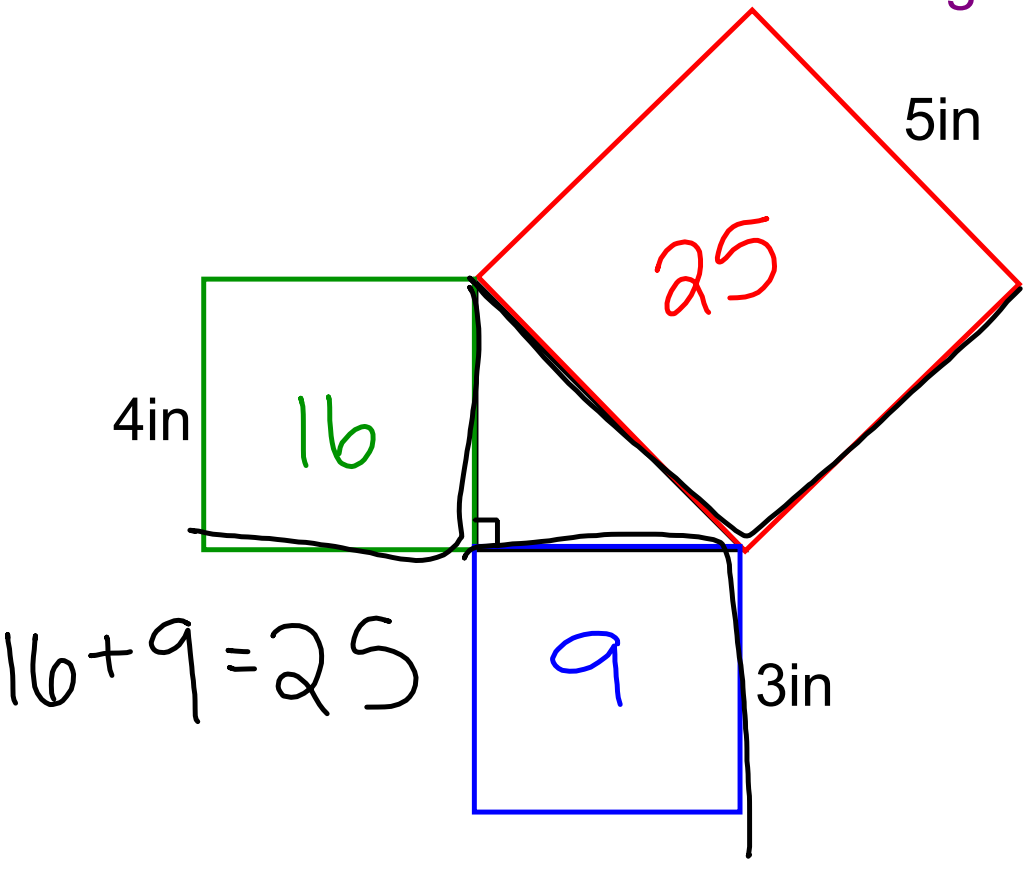
Right Angle

Leg

Leg

Leg

Find the area of each rectangle

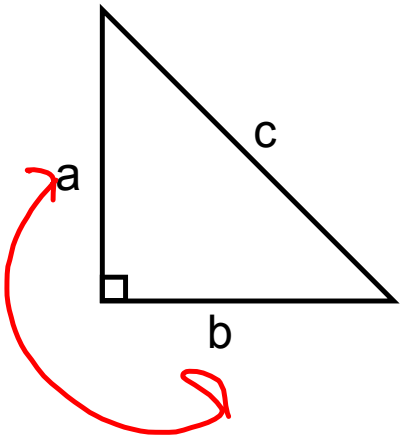


How are the areas of the green and blue squares related to the red square?

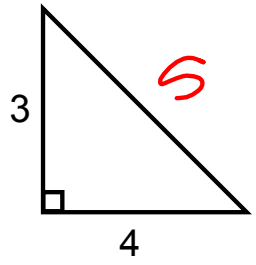
Pythagorean Theorem

In a right triangle where a and b are the legs and c is the hypotenuse,

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



Find the missing side in the right triangle using the pythagorean theorem:



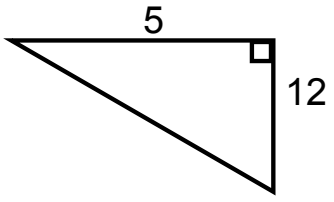
$a^2+b^2=c^2$

$3^2+4^2=c^2$

$9+16=c^2$

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

$5=c$



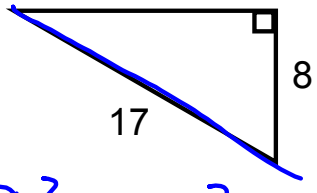
$a^2+b^2=c^2$

$5^2+12^2=c^2$

$25+144=c^2$

$\sqrt{169}=\sqrt{c^2}$

$13=c$



$8^2+b^2=17^2$

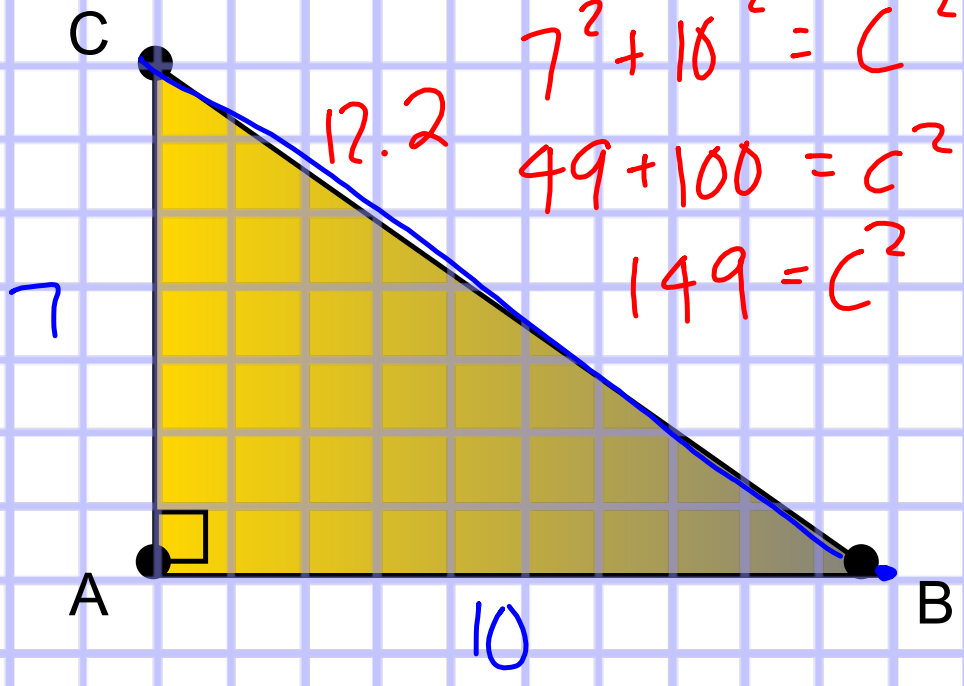
$64+b^2=289$

$-64 \quad -64$

$\sqrt{b^2}=\sqrt{225}$

$b=15$

Using the Pythagorean Theorem to find the distance between C and B.



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