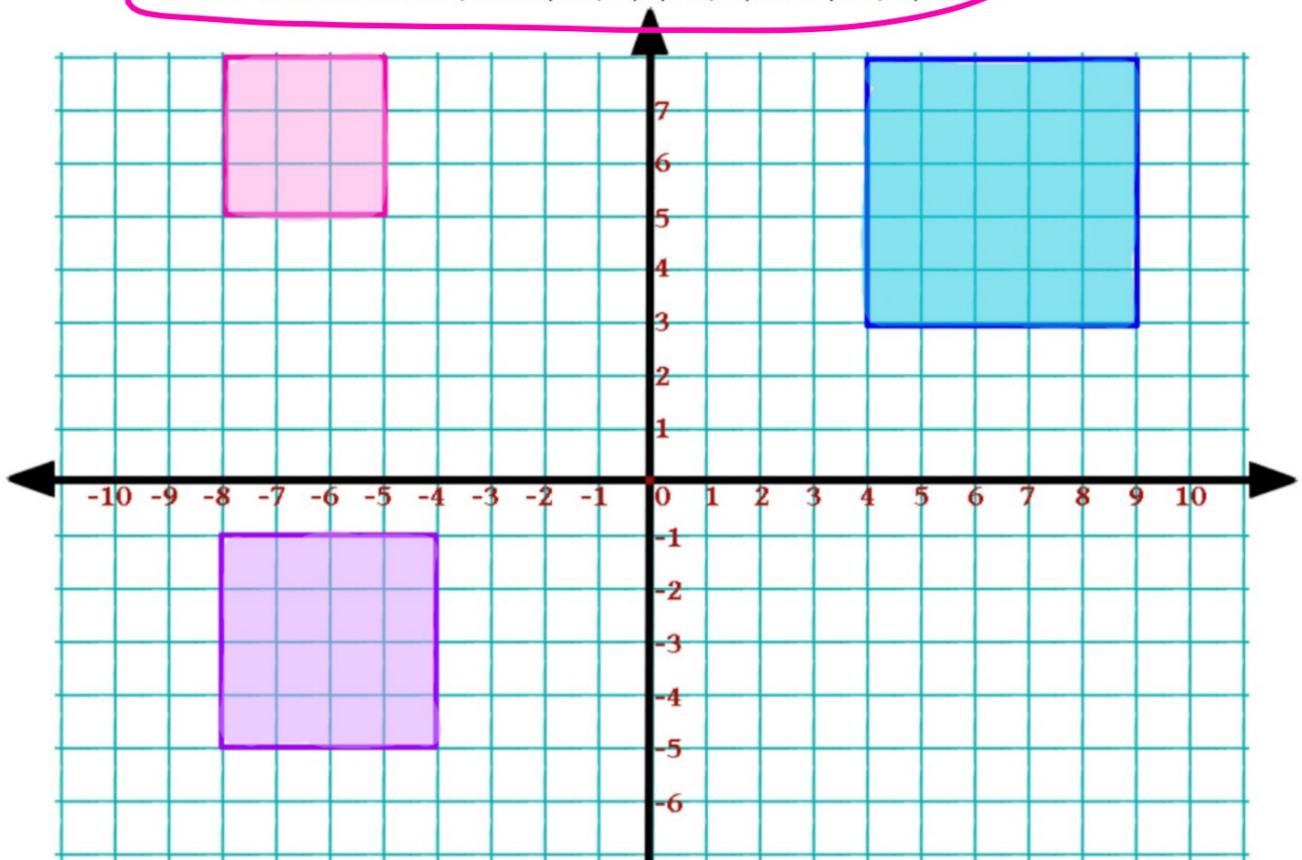
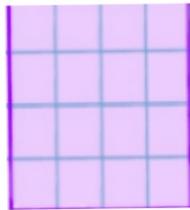
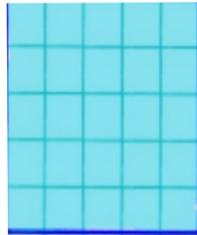


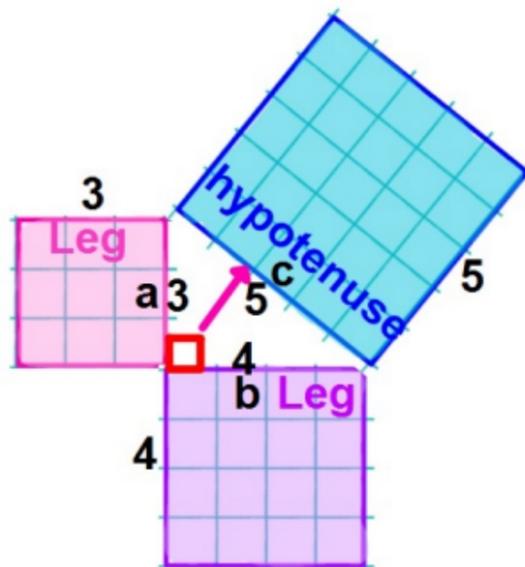
Color and cut out 3 squares (3 by 3), (4 by 4), and (5 by 5)



Arrange them so one corner of each square touches with a triangle then created in the center.



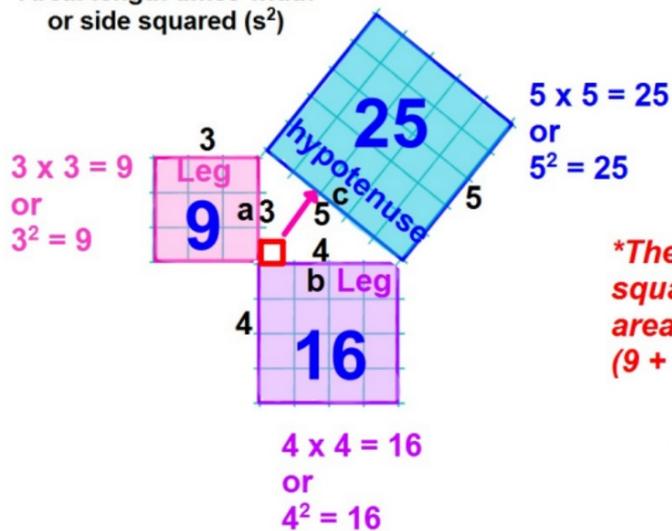
What is the relationship between the areas of all the squares?



Can you come up with a formula that would work everytime to prove this?

Pythagorean Theorem

Area: length times width
or side squared (s^2)



What is the relationship
between the areas of
all the squares?

**The areas of the two smaller
squares added together equals the
area of the largest square.
(9 + 16 = 25)*

Can you come up with a
formula that would work
everytime to prove this?

$$a^2 + b^2 = c^2 \text{ or } c^2 = a^2 + b^2$$

**Congratulations you just proved the
Pythagorean Theorem!**

Discovered by the Greek Mathematician Pythagoras.

$$3^2 + 4^2 = 5^2$$

$$9 + 16 = 25$$

$$25 = 25$$

Proves it's a
right triangle!

<https://www.geogebra.org/m/WpEAMAak>

Extension/Enrichment: Click Link
Below for Converse of the
Pythagorean Theorem Investigation

[https://www.geogebra.org/m/
WpEAMAak](https://www.geogebra.org/m/WpEAMAak)

<https://www.geogebra.org/m/WpEAMAak>

Converse of the Pythagorean Theorem

Classify a Triangle as Right, Acute, or Obtuse

Click and drag point A to change the measure of $\angle C$.
(make sure that c remains larger than a and b. Because we want to check if C is a right angle)
Notice the relationship between c^2 and a^2+b^2
when $\angle C$ is acute, obtuse, or right.

$c^2=45$

$a^2+b^2=45$

$\alpha = 90^\circ$

$\beta = 63.43^\circ$

$\gamma = 26.57^\circ$

$a = 6$

$b = 3$

$c = 6.71$

After completing the activity, how can you use the Pythagorean Theorem formula to determine if a triangle is acute, obtuse, or right?

$c^2 = a^2 + b^2$ *Right Triangle*

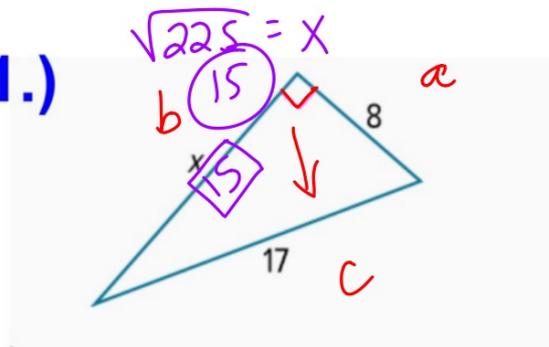
$c^2 < a^2 + b^2$ *Acute*

$c^2 > a^2 + b^2$ *Obtuse*



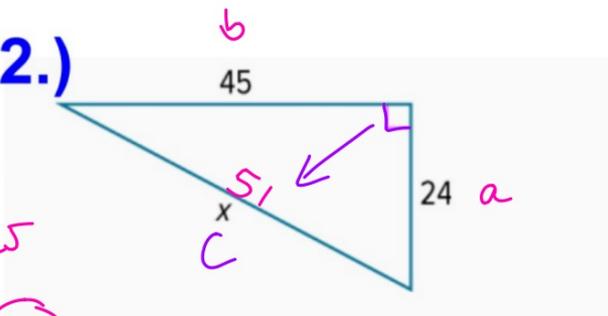
$$\begin{aligned}
 c^2 &= a^2 + b^2 \\
 17^2 &= 8^2 + x^2 \\
 289 &= 64 + x^2 \\
 -64 & \quad -64 \\
 \hline
 225 &= x^2
 \end{aligned}$$

1.)

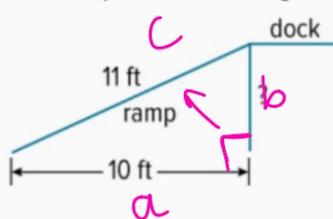


$$\begin{aligned}
 c^2 &= a^2 + b^2 \\
 x^2 &= 24^2 + 45^2 \\
 x^2 &= 576 + 2025 \\
 x^2 &= 2601 \\
 x &= \sqrt{2601} = 51
 \end{aligned}$$

2.)

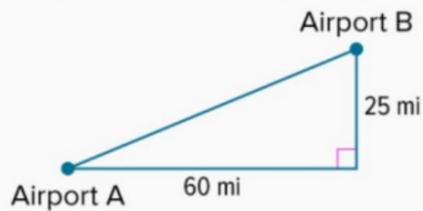


- 3.) The bottom end of a ramp at a warehouse is 10 feet from the base of the main dock, and the ramp is 11 feet long. How high is the dock? (Example 3)



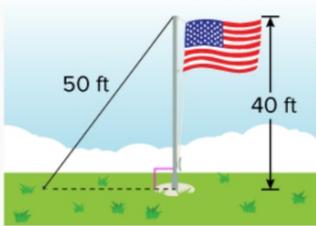
$$\begin{aligned}
 c^2 &= a^2 + b^2 \\
 11^2 &= 10^2 + b^2 \\
 121 &= 100 + b^2 & \sqrt{21} = b \\
 \underline{-100 \quad -100} & & 4.582 \\
 21 &= b^2 & \boxed{4.6}
 \end{aligned}$$

- 4.) An airplane lands at an airport 60 miles east and 25 miles north of where it took off. How far apart are the two airports? (Example 3)



5.)

To help support a flag pole, a 50-foot-long tether is tied to the pole at a point 40 feet above the ground. The tether is pulled taut and tied to an anchor in the ground. How far away from the base of the pole is the anchor?



6.)

Determine whether the points $A(2, 2)$, $B(5, 7)$, and $C(10, 6)$ can be the vertices of a triangle. If so, classify the triangle as acute, right, or obtuse. Justify your answer.

