

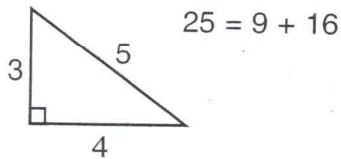
Name \_\_\_\_\_

# The Converse of the Pythagorean Theorem

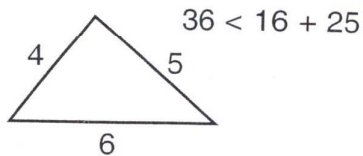
## Remember

The Pythagorean Theorem can be used to determine whether a triangle is right, acute, or obtuse. Think of the long side as  $c$  and the two shorter sides as  $a$  and  $b$ .

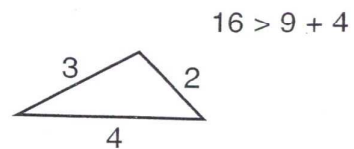
If  $c^2 = a^2 + b^2$ , then it is a right triangle.



If  $c^2 < a^2 + b^2$ , then it is an acute triangle.



If  $c^2 > a^2 + b^2$ , then it is an obtuse triangle.



Determine whether the following lengths create a right, acute, or obtuse triangle or no triangle. Shade in the matching column letters and copy them onto the blanks to reveal the name of the U.S. president who discovered a proof of the Pythagorean Theorem.



lengths	right	acute	obtuse	no triangle
1. 6, 8, 10	J	A	T	W
2. 1, 2, 3	E	H	B	A
3. 5, 5, 5	R	M	O	S
4. 7, 8, 12	A	M	E	H
5. 7, 8, 9	R	S	H	A
6. 5, 9, 11	O	N	A	S
7. 5, 12, 13	G	Z	A	M
8. 11, 11, 15	P	A	P	T
9. 16, 30, 34	R	E	L	O
10. 20, 40, 50	A	G	F	N
11. 9, 12, 15	I	A	S	H
12. 5, 7, 13	S	N	G	E
13. 8, 14, 17	O	N	L	Y
14. 13, 18, 22	T	D	N	H

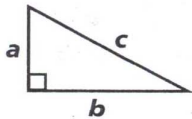
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# The Pythagorean Theorem

## Remember

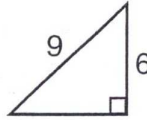
In a right triangle, the sum of the squares of the legs is equal to the square of the hypotenuse:

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



### Example:

Find the length of the missing side.



$$9^2 = 6^2 + b^2$$

$$81 = 36 + b^2$$

$$45 = b^2$$

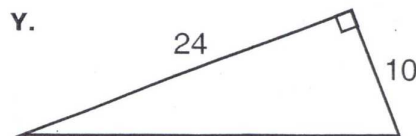
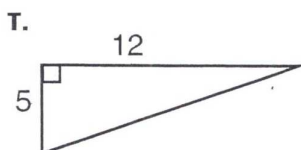
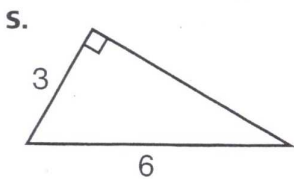
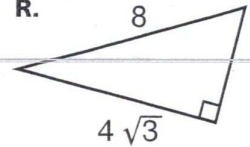
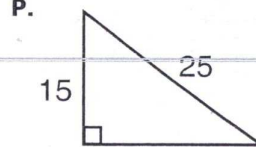
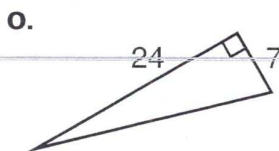
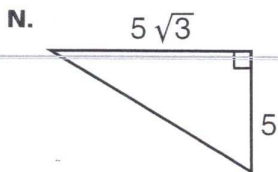
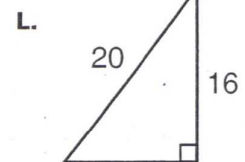
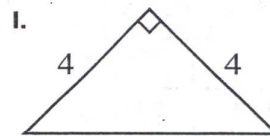
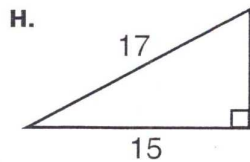
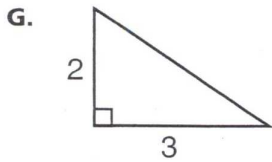
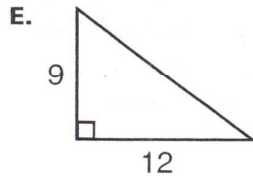
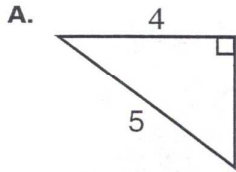
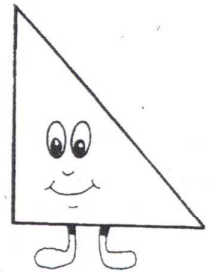
$$\sqrt{45} = b$$

$$\sqrt{9} \cdot \sqrt{5} = b$$

$$3\sqrt{5} = b$$

Solve for the missing side. Use the answer code to find the special name for three integers whose lengths form a right triangle.

**TIP!** A 3-4-5 triangle has a leg-to-leg-to-hypotenuse ratio of 3:4:5. If you can spot multiples of these numbers, you can solve those problems easily.



20 26 13 8 3  $\sqrt{13}$  25 4 15 3 10

13 4  $4\sqrt{2}$  20 12 15  $3\sqrt{3}$