

8-3: The Converse of the Pythagorean Theorem

Using the table below and your pipe cleaner, create triangles with the given sides. Decide whether the triangle looks acute, right or obtuse and write that in the fourth column. The last column is for you to decide whether $a^2 + b^2$ is $<$, $>$, or $= c^2$ and write the correct symbol in the last column.

a	b	c	acute, right or obtuse?	$a^2 + b^2$ <u> </u> c^2 <i>>, <, =</i>
6	7	8	<i>acute</i>	<i>></i>
7	8	11	<i>obtuse</i>	<i><</i>
6	8	10	<i>right</i>	<i>=</i>
2	4	8	<i>No Δ</i>	<i>—</i>

Using the table above, answer the following questions.

How do we decide which side of a triangle is c ?

longest side

How do we determine whether a triangle is acute?

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

How do we determine whether a triangle is right?

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

How do we determine whether a triangle is obtuse?

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

Using the information from the table, determine whether the following will be triangles. If they are, decide if they are acute, right, or obtuse.

1) 4, 5, 6^c

$$6^2 < 4^2 + 5^2$$
$$36 < 16 + 25$$

acute

2) 5, 12, 13

$$13^2 = 5^2 + 12^2$$
$$169 = 25 + 144$$

right

3) 2, 7, 9

no Δ

4) 1, $\sqrt{7}$, $2\sqrt{2}$

$$(2\sqrt{2})^2 = 1^2 + (\sqrt{7})^2$$
$$8 = 1 + 7$$

right

5) $\frac{1}{4}$, $\frac{3}{4}$, $\frac{3}{4}$

$$\left(\frac{3}{4}\right)^2 < \left(\frac{1}{4}\right)^2 + \left(\frac{3}{4}\right)^2$$

acute

6) 0.7, 0.8, 0.9

$$(.9)^2 < (.7)^2 + (.8)^2$$
$$.81 < .49 + .64$$

acute