Pythagorean Triples

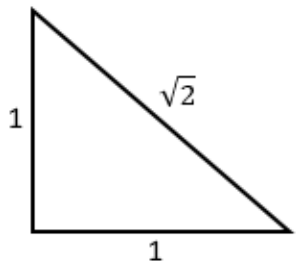
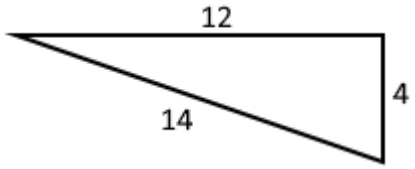
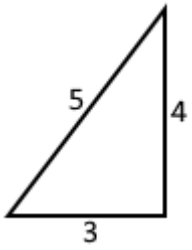
Objective

Print this worksheet to complete the activity. By completing this worksheet, you will be able to use the Pythagorean theorem to identify Pythagorean triples.

The Pythagorean Theorem

The **Pythagorean theorem** states that for a right triangle, the sum of the squares of the legs is equal to the square of the hypotenuse. In other words, if a right triangle has legs with side lengths of a and b and a hypotenuse with side length of c, then $a^2 + b^2 = c^2$.

If the values a, b, and c satisfy the Pythagorean theorem and are all positive integers, then they form a **Pythagorean triple**. We write the triple in the form (a, b, c). The three values are listed in order from least to greatest so that the last value is always the hypotenuse.

		
$1^2 + 1^2 = (\sqrt{2})^2$ $1 + 1 = 2$ $2 = 2$	$4^2 + 12^2 = 14^2$ $16 + 144 = 196$ $160 \neq 196$	$3^2 + 4^2 = 5^2$ $9 + 16 = 25$ $25 = 25$
These lengths satisfy the Pythagorean theorem but are not all integers, so they do not form a Pythagorean triple.	These lengths do not satisfy the Pythagorean theorem, so the triangle is not a right triangle.	These lengths satisfy the Pythagorean theorem and are all positive integers, so (3, 4, 5) forms a Pythagorean triple.

Question

Use the Pythagorean theorem to determine whether each set of values forms a Pythagorean triple.

1. (8, 15, 17) _____

2. (1, $\sqrt{3}$, 2) _____

3. (9, 12, 16) _____

4. (8, 11, 14) _____

5. (20, 21, 29) _____

6. (30, 40, 50) _____