IS IT A TRIANGLE? – SAMPLE RESPONSE

With your partner, use the provided GeoGebra activity to complete the table below. If a set of sides do not make a triangle, write "not a triangle" in the third column.
GeoGebra link: https://www.geogebra.org/m/tgwg6tnj.

Number Sets	Is It a Triangle? (Yes/No)	What Type of Triangle? (Acute, Obtuse, Right)	$a+b$	> < =	c
3, 4, 5	Yes	Right	7	>	5
1, 2, 3	No	Not a Triangle	3	=	3
6, 5, 10	Yes	Obtuse	11	>	10
12, 16, 18	Yes	Acute	28	>	18
7, 3, 12	No	Not a Triangle	10	<	12

How do we know if three line segments make a triangle?

When constructing a triangle, all three sides must meet the other at their endpoints. There cannot be any overlap or gaps.

What algebra can help us calculate this?

Notation	$a + b > c$

How do we know what type of triangle a set of segments creates?
When constructing a triangle, you can use a protractor to determine the type of triangle you have.
What algebra can help us calculate this?

Type of Triangle	Notation
Right	$a^2 + b^2 = c^2$
Acute	$a^2 + b^2 > c^2$
Obtuse	$a^2 + b^2 < c^2$

IS IT A TRIANGLE? (TEACHER GUIDE)
Example Solutions for Lesson Slides

Slide 19: 5, 12, 13

Step 1: Ask yourself: Is it a triangle?
$a + b > c$
$5 + 12 > 13$
This statement is true, therefore it's a triangle.

Step 2: Classify the triangle.
$$a^2 + b^2 \;\square\; c^2$$
(Which symbol goes in the box? $=, <, >$)
$$5^2 + 12^2 \;\square\; 13^2$$
$25 + 144 \;\square\; 169$
$169 = 169$
Because the two sides of the expression equal each other, it is a right triangle.

Slide 23: 3, 3, 4

Step 1: Ask yourself: Is it a triangle?
$a + b > c$
$3 + 3 > 4$
This statement is true, therefore it's a triangle.

Step 2: Classify the triangle.
$$a^2 + b^2 \;\square\; c^2$$
(Which symbol goes in the box? $=, <, >$)
$$3^2 + 3^2 \;\square\; 4^2$$
$9 + 9 \;\square\; 16$
$18 > 16$
Because the left side is larger than the right, it is an acute triangle.

Slide 27: 3, 4, 7

Step 1: Ask yourself: Is it a triangle?
$a + b > c$
$3 + 4 > 7$
This statement is true, therefore it's a triangle.

Step 2: Classify the triangle.
$$a^2 + b^2 \;\square\; c^2$$
(Which symbol goes in the box? $=, <, >$)
$$3^2 + 4^2 \;\square\; 7^2$$
$9 + 16 \;\square\; 49$
$25 < 49$
Because the left side is less than the right, it is an obtuse triangle.