

Lesson 7: Introduction to Trigonometry

Are You Ready? Possible Answers

1. A right triangle must have one angle that is exactly 90° .
2. The three angles of every triangle in the world will always add to 180° .
3. $90^\circ + 50^\circ + x = 180^\circ$
 $140^\circ + x = 180^\circ$
 $x = 40^\circ$
4. The Pythagorean theorem states that in any right triangle, the square of the length of the hypotenuse equals the sum of the squares of the lengths of the legs of the right triangle. The Pythagorean Theorem can be used when you need to determine the length of the side of a right triangle.
The Pythagorean theorem can be written as $a^2 + b^2 = c^2$ when finding the missing hypotenuse.
The Pythagorean theorem can be re-arranged when needing to find a missing side (or leg).
 $a^2 + b^2 = c^2$ subtract b^2 from both sides and get
 $a^2 + b^2 - b^2 = c^2 - b^2$
 $a^2 = c^2 - b^2$
OR
 $a^2 + b^2 = c^2$ subtract a^2 from both sides and get
 $a^2 - a^2 + b^2 = c^2 - a^2$
 $b^2 = c^2 - a^2$

5.

$$a^2 + b^2 = c^2$$
$$6 \text{ cm}^2 + 8 \text{ cm}^2 = y^2$$
$$36 \text{ cm}^2 + 64 \text{ cm}^2 = y^2$$
$$100 \text{ cm}^2 = y^2$$
$$10 \text{ cm} = y$$

The missing hypotenuse is 10 cm.

6.

$$b^2 = c^2 - a^2$$
$$x^2 = (13 \text{ cm})^2 - (12 \text{ cm})^2$$
$$x^2 = 169 \text{ cm}^2 - 144 \text{ cm}^2$$
$$x^2 = 25 \text{ cm}^2$$
$$x = 5 \text{ cm}$$

The length of the missing side (or leg) is 5 cm

7a. $a^2 + b^2 = c^2$
 $(2.1 \text{ in})^2 + (4.4 \text{ in})^2 = z^2$
 $4.41 \text{ in}^2 + 19.36 \text{ in}^2 = z^2$
 $23.77 \text{ in}^2 = z^2$
 $4.9 \text{ in} = z$

The hypotenuse is 4.9 in.

b. $b^2 = c^2 - a^2$
 $h^2 = (41.2 \text{ m})^2 - (25.8 \text{ m})^2$
 $x^2 = 1697.44 \text{ m}^2 - 665.64 \text{ m}^2$
 $x^2 = 1031.8 \text{ m}^2$
 $x = 32.1 \text{ m}$

The length of the missing side (or leg) is 32.1 m