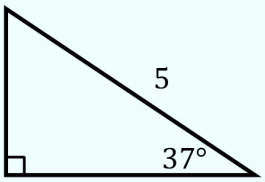
TOPIC: SOLVING RIGHT TRIANGLES

Finding Missing Side Lengths

◆ If given one _____ & one _____, find missing side lengths using trig equations & Pythagorean Theorem.

EXAMPLE Find all side lengths of the given triangle.



HOW TO SOLVE: RIGHT TRIANGLES
(GIVEN 1 SIDE & 1 ANGLE)

1) Find other angle using $\angle B = \_\_\_\_ - \angle A$

2) Choose a trig function so

$$any\ trig(\angle A) = \frac{given\ side}{x} \text{ or}$$
$$any\ trig(\angle A) = \frac{x}{given\ side}$$

3) Solve equation for x (2nd side length)

4) Use Pythagorean Theorem to find 3rd side

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

SOH – CAH – TOA

TOPIC: SOLVING RIGHT TRIANGLES

PRACTICE

A right triangle with an angle of $31°$ has a hypotenuse of 10. Calculate the side of the triangle opposite to the $31°$ angle (y), and the side adjacent to the $31°$ angle (x). Round your answer to 3 decimal places.

TOPIC: SOLVING RIGHT TRIANGLES

EXAMPLE

The Grand Lighthouse on a coastal cliff stands 288 m tall and is positioned approximately 2.3 km inland from the shore of the Sea. A seafarer on a sailboat directly in front of the lighthouse observes the top of the structure and records the angle of elevation as 3.4°. Determine the distance (in kilometers) of the sailboat from the coastline to two decimal places.

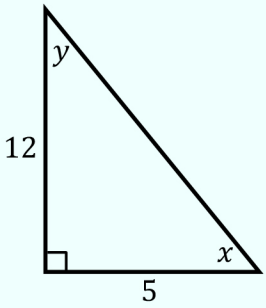
TOPIC: SOLVING RIGHT TRIANGLES

Finding Missing Side Lengths

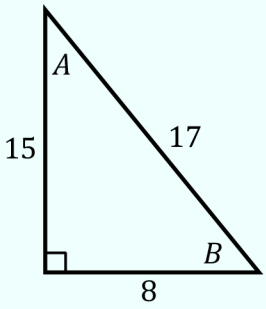
◆ If you're given 2+ _____ lengths of a triangle, find the missing angle(s) using trig & inverse trig equations.

EXAMPLE Find all angles of the given triangle.

$(\boldsymbol{A})$



$(\boldsymbol{B})$



HOW TO SOLVE RIGHT TRIANGLES
(GIVEN 2+ SIDES)

1) If missing a side, use Pythagorean theorem

2) For ANY non-90° angle, write the trig equation with the known sides

3) Take the inverse trig fn of each side of eqn & solve for ∠

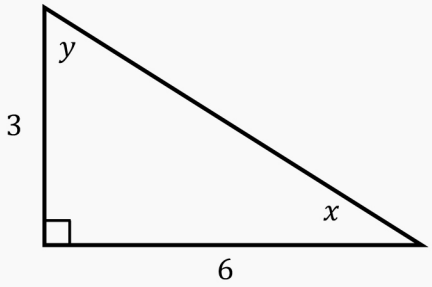
4) Find other angle using $\angle B = 90° - \angle A$

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

SOH – CAH – TOA

TOPIC: SOLVING RIGHT TRIANGLES

PRACTICE Given the right triangle below, calculate all missing angles in degrees (round your answer to 3 decimal places).



TOPIC: SOLVING RIGHT TRIANGLES

EXAMPLE

A hiking path can be traced from a mountain lodge (at an elevation of 6500 feet) to a scenic viewpoint in a canyon (at an elevation of 4300 feet). The path spans 4400 feet. Determine the angle of inclination of the hiking path.