

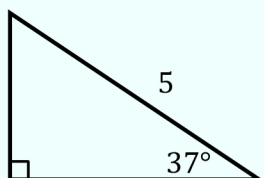
## TOPIC: SOLVING RIGHT TRIANGLES

### 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  $\angle B = \text{---} - \angle A$

2) Choose a trig function so

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

3) Solve equation for  $x$  (2<sup>nd</sup> side length)

4) Use Pythagorean Theorem to find 3<sup>rd</sup> side

#### Recall

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



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## TOPIC: COFUNCTIONS OF COMPLEMENTARY ANGLES

### PRACTICE

A right triangle with an angle of  $31^\circ$  has a hypotenuse of 10. Calculate the side of the triangle opposite to the  $31^\circ$  angle ( $y$ ), and the side adjacent to the  $31^\circ$  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  $3.4^\circ$ . Determine the distance (in kilometers) of the sailboat from the coastline to two decimal places.

## TOPIC: SOLVING RIGHT TRIANGLES

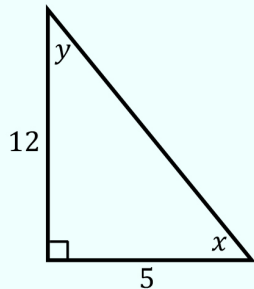
### Finding Missing Angles

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

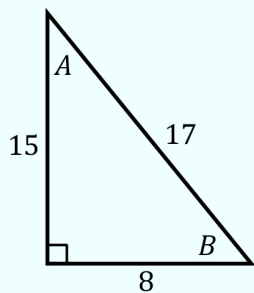
#### EXAMPLE

Find all angles of the given triangle.

(A)



(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  $\angle$
- 4) Find other angle using  $\angle B = 90^\circ - \angle A$

#### Recall

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

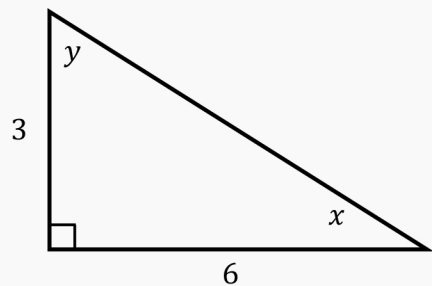


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## TOPIC: SOLVING RIGHT TRIANGLES

### 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.