Right Angle Trigonometry

Section 13.1

Trigonometric Functions

SOH CAH TOA

6 Trig Functions

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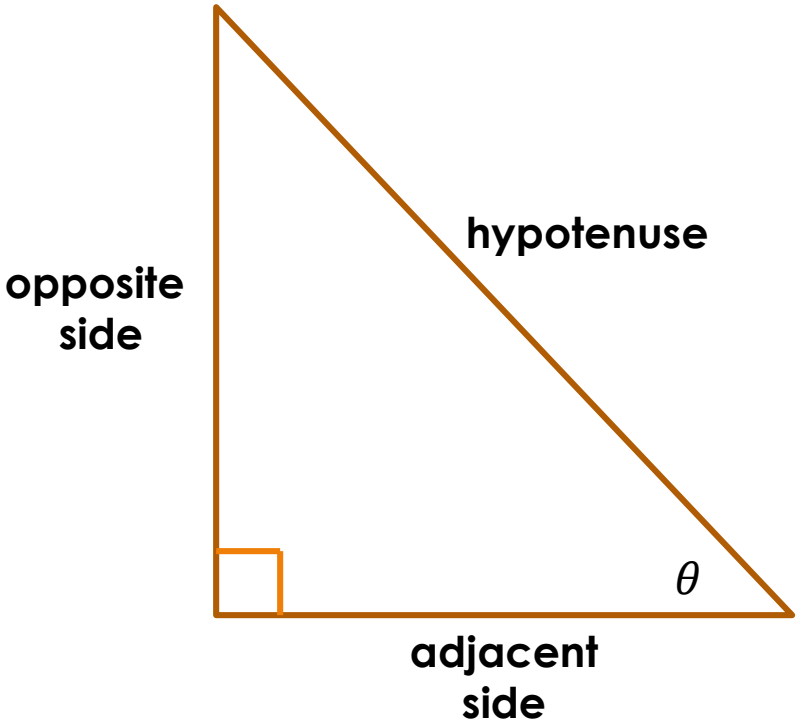
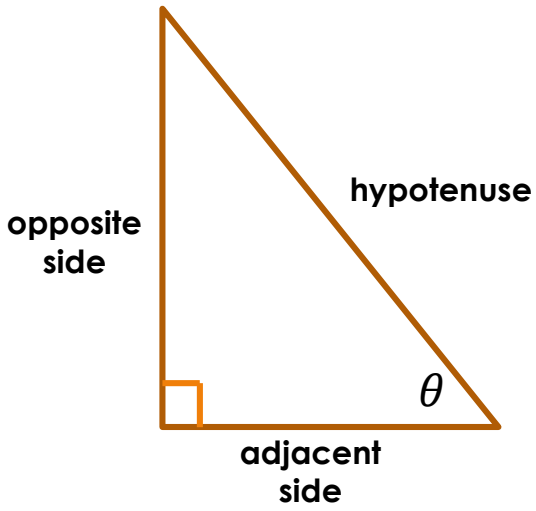


Trig Ratios

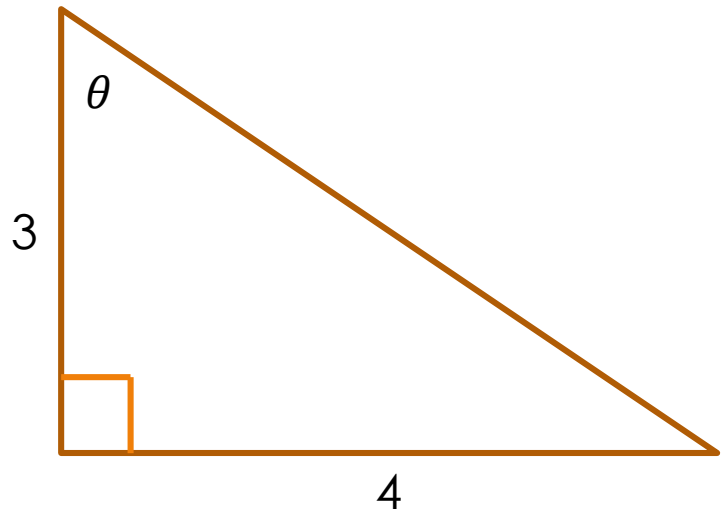
- $\sin\theta =$
- $\cos\theta =$
- $\tan\theta =$
- $\csc\theta =$
- $\sec\theta =$
- $\cot\theta =$



Evaluating Trigonometric Functions

- Evaluate the 6 trigonometric functions of the angle θ shown in the right triangle

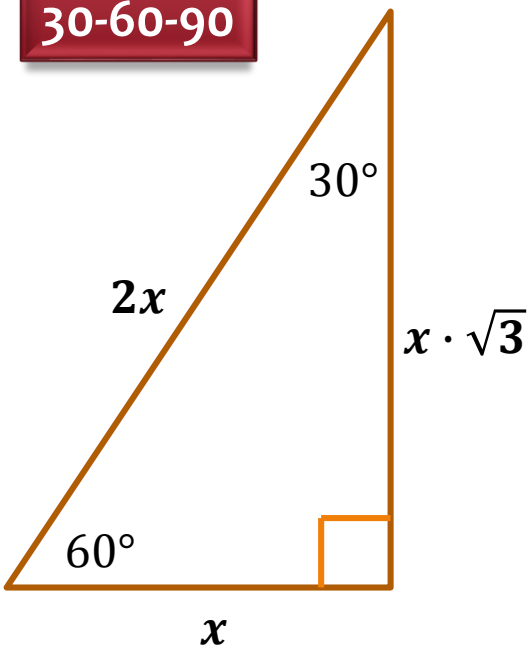
leave answers as simplified ratios



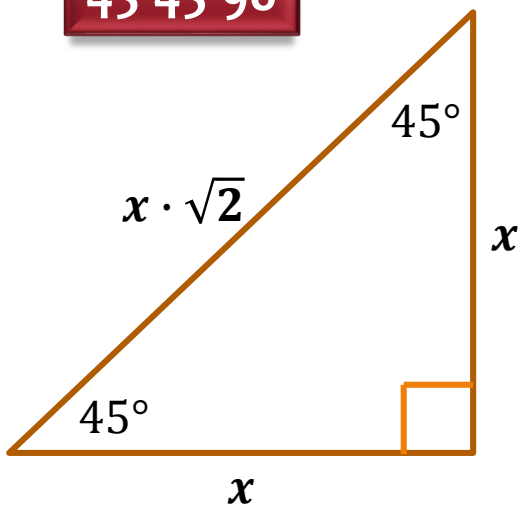
Special Right Triangles

- Remember the relationships between side lengths in 30-60-90 and 45-45-90 triangles

30-60-90

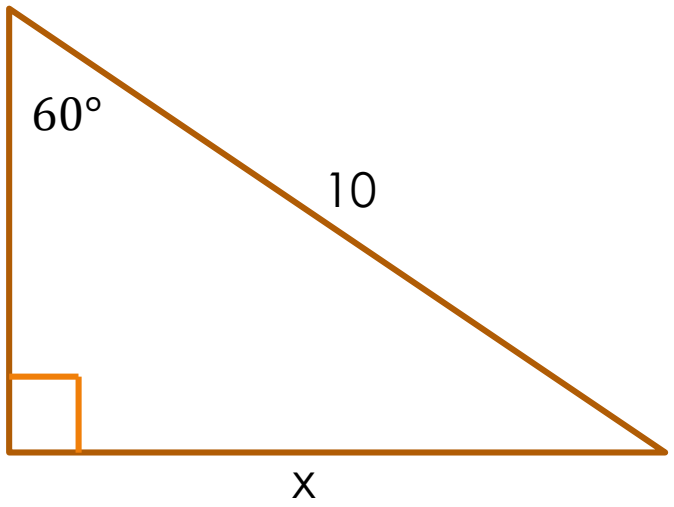


45-45-90



Finding a missing side length with trigonometry

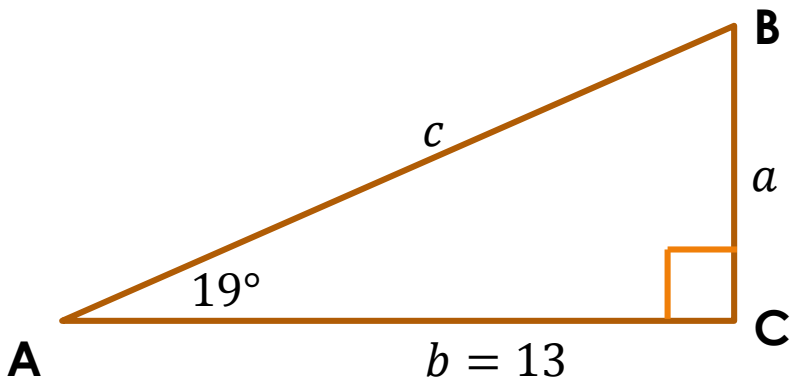
- Find the value of x for the right triangle shown to the left. Round your answer to the nearest hundredth



Solving a Right Triangle

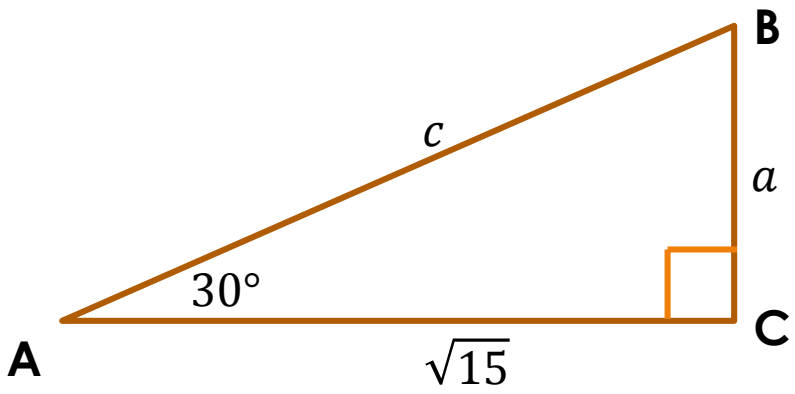
- Solve ΔABC

To solve a right triangle means to figure out all of its side lengths and angle measures



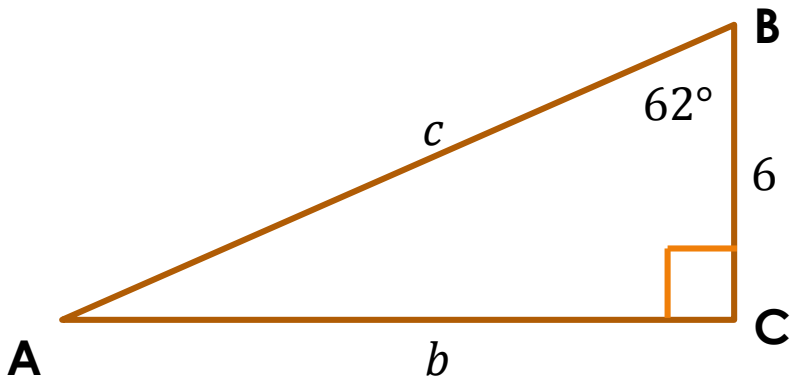
Solve the Triangle

- Without a calculator



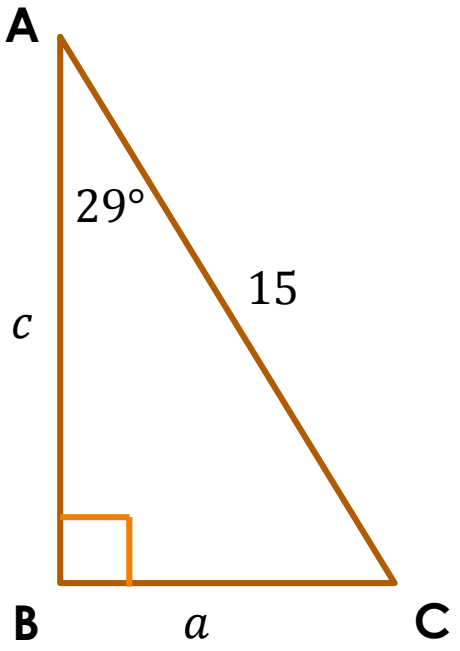
Solve the Triangle

- With a calculator *(round to the nearest tenth)*



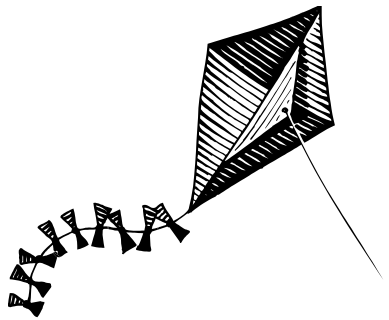
Solve the Triangle

- With a calculator *(round to the nearest hundredth)*



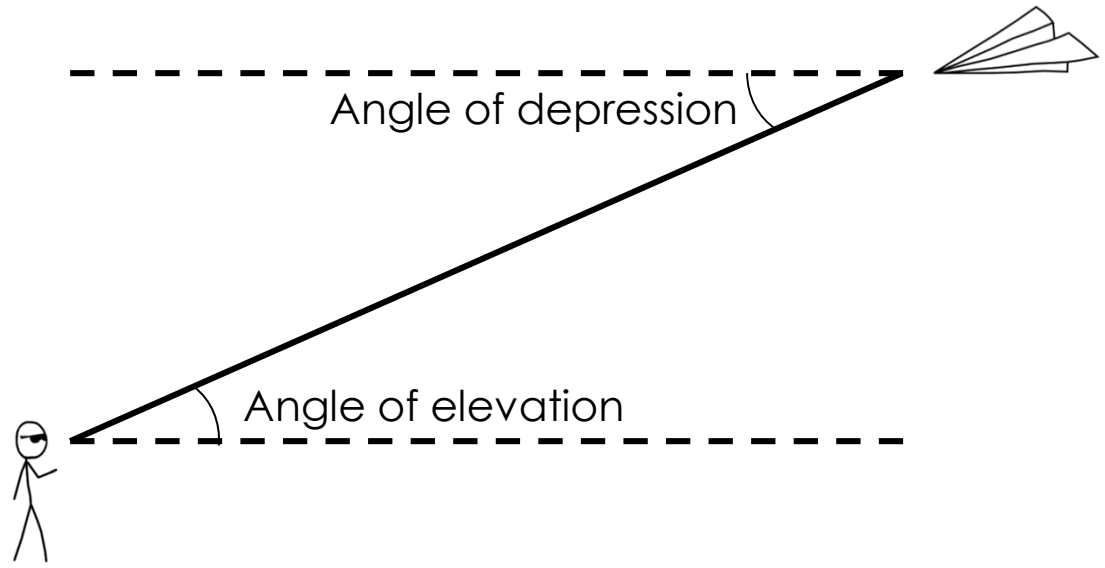
Real Life Scenario

- You are flying a kite outside on a windy day. If you are holding the string 4 feet above the ground, and are using 300 feet of string, how high is the kite if the wind speed of 40 mph is causing the kite to make a 29° angle with the ground?



Angles Made with the Horizon

- **Angles of Elevation** and **Angles of Depression** have the same measure *(alternate interior angles)*

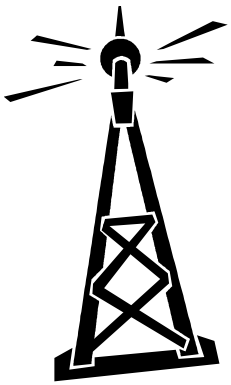


Real Life Scenario

- An airplane flying at an altitude of 30,000 feet is headed towards an airport. To guide the airplane to a safe landing, the airport's landing system sends radar signals from the runway to the airplane at a $10°$ angle of elevation. How far is the airplane *(measured along the ground)* from the airport runway?
  - Draw a diagram
  - How far in feet? (rounded to the nearest foot)
  - How far in miles? (rounded to the nearest tenth of a mile)

Real Life Scenario

- A support cable from a radio tower makes an angle of 56° with the ground. If the cable is 250 feet long, how far above the ground does it meet the tower?
  - Draw a diagram
  - Round the nearest foot



Real Life Scenario

- You are standing at the base of a giant sequoia, 150 feet from its base. The angle of elevation to the sun is 63°. How tall is the tree?
  - Draw a diagram
  - Round to the nearest foot