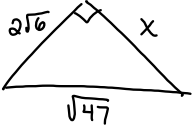


Solving Right Triangles

1, 14, 16, 18



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

$$x^2 + (2\sqrt{6})^2 = (\sqrt{47})^2$$

$$x^2 + 24 = 47$$

$$\begin{array}{r} x^2 + 24 = 47 \\ -24 \quad -24 \\ \hline \end{array}$$

$$\sqrt{x^2} = \sqrt{23}$$

$$x = \sqrt{23}$$

7.7

Dec 1-8:37 AM

A right triangle has six parts:

- one right angle
- two acute angles
- one hypotenuse
- two legs

To [solve a right triangle](#) means to determine the measurements of all angles and sides of the triangle.

To solve a right triangle, you need either of the following:

- two side lengths
- one side length and one acute angle measure

Solving Right Triangles

If you are given two side lengths:

- Use the Pythagorean Theorem to find the third side.
- Use the inverse trig ratios to find the two acute angles.

If you are given one side length and one acute angle:

- Subtract the given acute angle from 90° to find the third angle.
- Use trig ratios to find the two unknown side lengths.

Solve the right triangle.

$m\angle A = 90 - 52 = 38^\circ$

AC $\cos 52^\circ = \frac{19}{AC}$
 $AC = \frac{19}{\cos 52^\circ} = 30.86$

AB $\tan 52^\circ = \frac{AB}{19}$
 $19 \tan 52^\circ = AB = 24.32$

$m\angle A = 38^\circ$
 $AB = 24.32$
 $AC = 30.86$

example

Solve the right triangle.

$m\angle X$ $\sin X = \frac{10}{25}$
 $X = \sin^{-1}(\frac{10}{25})$
 $X = 23.58^\circ$

$m\angle Y = 90 - 23.58 = 66.42^\circ$

$XZ = \sqrt{25^2 - 10^2} = \sqrt{625 - 100} = \sqrt{525} = 22.91$

$XZ = 22.91$
 $m\angle X = 23.58^\circ$
 $m\angle Y = 66.42^\circ$

example

Conclusion

1. What do we need to do to solve a triangle? *Find all other \angle s and sides*
2. What do you find first if you are given a rt. angle, and two sides? *Pythagorean Thm or Trig. Ratio*
3. What do you do first if you are given a rt. angle, acute angle, and a side? *Find 3rd \angle s or Trig. Ratio*
4. Questions????

Assignment

Solving a Triangle Wkst