

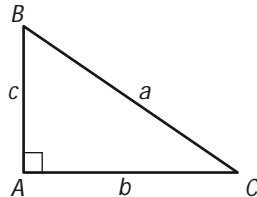
Middle School Math COURSE 3
Chapter 9, Lesson 6, More Examples

Extra Example 1

for use before Example 1

Understanding Right Triangles

Name the lengths of the hypotenuse and the sides opposite and adjacent to angles B and C in the triangle below.



Solution

The hypotenuse of a right triangle is the side opposite the right angle. In triangle ABC , the length of the hypotenuse is a .

The side opposite $\angle B$ has length b and the side adjacent to $\angle B$ has length c . The hypotenuse is also adjacent to $\angle B$, but the opposite side and adjacent side always refer to the legs.

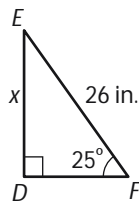
The side opposite $\angle C$ has length c and the side adjacent to $\angle C$ has length b . Again, the hypotenuse is also adjacent to $\angle C$, but the adjacent side is not the hypotenuse.

Extra Example 2

for use after Example 1

Writing a Sine, Cosine, or Tangent Ratio

Write a trigonometric ratio that could be used to find the length x in the triangle below.



Solution

In triangle DEF , you are given the measure of $\angle F$, and the length of \overline{EF} . You want to find the length of \overline{DE} . \overline{DE} is opposite $\angle F$, and \overline{EF} is the hypotenuse. Therefore, write a ratio that relates the opposite side and the hypotenuse. The sine of $\angle F$ relates the opposite side and the hypotenuse.

$$\sin F = \frac{\text{opposite}}{\text{hypotenuse}}$$

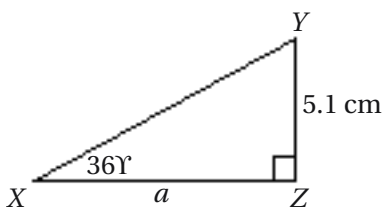
$$\sin 25^\circ = \frac{x}{26}$$

Extra Example 3

for use after Example 1

Writing a Sine, Cosine, or Tangent Ratio

Write a trigonometric ratio that could be used to find the length a in the triangle below.



Solution

In triangle XYZ , you are given the measure of $\angle X$, and the length of \overline{YZ} . You want to find the length of \overline{XZ} . \overline{YZ} is opposite of $\angle X$ and \overline{XZ} is adjacent to $\angle X$. Therefore, write a ratio that relates the side opposite and the side adjacent. The tangent of $\angle X$ relates the sides opposite and adjacent.

$$\tan X = \frac{\text{opposite}}{\text{adjacent}}$$

$$\tan 36^\circ = \frac{5.1}{a}$$