

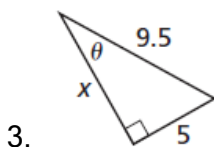
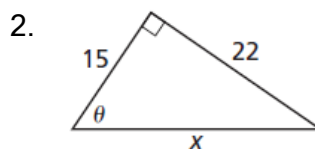
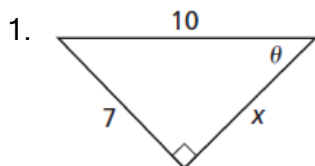


9.6: Solving Right Triangles

Essential Question

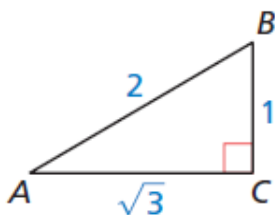
When you know the lengths of the sides of a right triangle, how can you find the measures of the two acute angles?

Find the value of x . Then find the value of $\sin \theta$, $\cos \theta$, and $\tan \theta$ for the triangle.

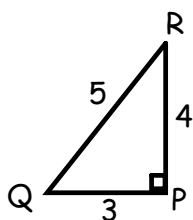


Examples

Determine which of the two acute angles has a cosine of 0.5.



Determine which of the two acute angles has a tangent of 0.75.

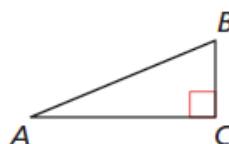


Now do problems 1-3 on the Practice Assignment

Core Concept

Inverse Trigonometric Ratios

Let $\angle A$ be an acute angle.



Inverse Tangent If $\tan A = x$, then $\tan^{-1} x = m\angle A$.

$$\tan^{-1} \frac{BC}{AC} = m\angle A$$

Inverse Sine If $\sin A = y$, then $\sin^{-1} y = m\angle A$.

$$\sin^{-1} \frac{BC}{AB} = m\angle A$$

Inverse Cosine If $\cos A = z$, then $\cos^{-1} z = m\angle A$.

$$\cos^{-1} \frac{AC}{AB} = m\angle A$$

*** The key is that
The inverse functions find _____

Example

Let $\angle A$, $\angle B$, and $\angle C$ be acute angles. Use a calculator to approximate the measures of $\angle A$, $\angle B$, and $\angle C$ to the nearest tenth of a degree.

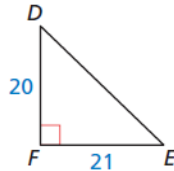
a. $\tan A = 0.75$

b. $\sin B = 0.87$

c. $\cos C = 0.15$

Example

Find the measure of all the angles in this triangle.



Now do problems 4-6 on the Practice Assignment

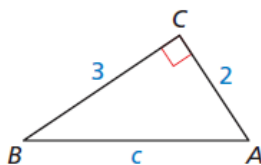
Core Concept

Solving a Right Triangle

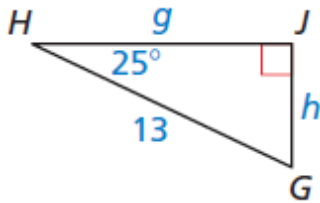
To **solve a right triangle** means to find all unknown side lengths and angle measures. You can solve a right triangle when you know either of the following.

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

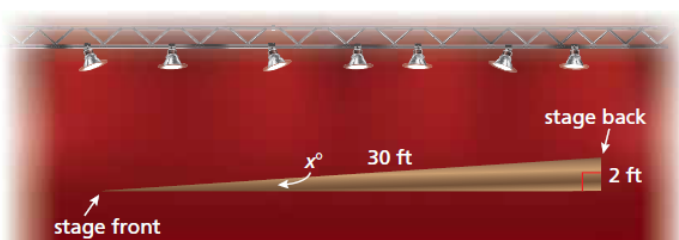
Solve the right triangle. Round decimal answers to the nearest tenth.



Solve the right triangle. Round decimal answers to the nearest tenth.



Your school is building a raked stage. The stage will be 30 feet long from front to back, with a total rise of 2 feet. You want the rake (angle of elevation) to be 5° or less for safety. Is the raked stage within your desired range?



Now finish the Practice Assignment