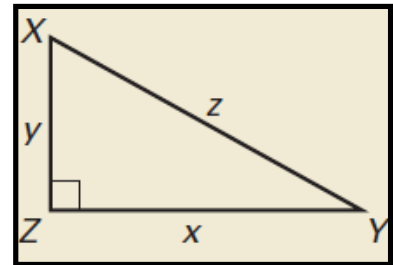


Bellwork

01/19/2012

Find the value of the variable.

1. If $x=4\sqrt{5}$, $y=4$, and $z=4\sqrt{6}$, find $\sin X$, $\sin Y$, $\cos X$, and $\cos Y$. Write your answer with 4 decimals.



Geometry
7.7 Solve Right Triangles
Standard(s): 4, 6

Vocabulary:

Solve a right triangle: To find the measures of all the sides and angles.

When you can solve a right triangle:

- When you have 2 side lengths
- When you have 1 side length, and the measure of one acute angle

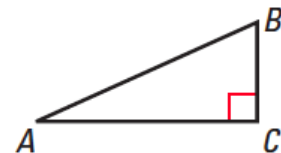
ONLY USE TO FIND ANGLES

KEY CONCEPT

For Your Notebook

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 $\cos^{-1} z = m\angle A$.

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

Use Inverse to Find an Angle

Let $\angle A$ be an acute angle. Approximate the measure of the angle to the nearest tenth of a degree.

$$\sin A = 0.36$$



$$m\angle A = \sin^{-1}(0.36)$$

$$m\angle A = 21.1^\circ$$

$$\tan A = 0.8$$

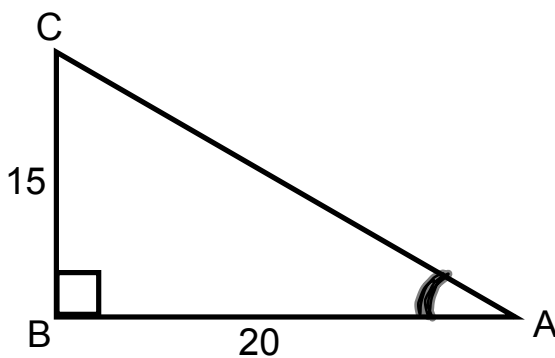


$$m\angle A = \tan^{-1}(0.8)$$

$$m\angle A = 38.7^\circ$$

Use Inverse Ratios

Use a calculator to approximate the measure of $\angle A$ to the nearest tenth of a degree.



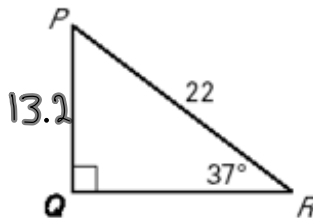
$$\tan A = \frac{15}{20}$$

$$m\angle A = \tan^{-1}\left(\frac{15}{20}\right)$$

$$m\angle A = 36.9^\circ$$

Solve a Right Triangle

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



$$1) 90 + 37 = 127^\circ$$

$$180 - 127 = 53^\circ$$

$$2) \sin 37 = \frac{PQ}{22}$$

$$PQ = 22 \cdot \sin 37$$

$$PQ = 13.2$$

$$PQ = 13.2$$

$$QR = 17.6$$

$$m\angle P = 53^\circ$$

$$3) \cos 37 = \frac{QR}{22}$$

$$QR = 22 \cdot \cos 37$$

$$QR = 17.6$$

$$QR = 14.4$$

$$m\angle Q = 56.3^\circ$$

$$m\angle R = 33.7^\circ$$

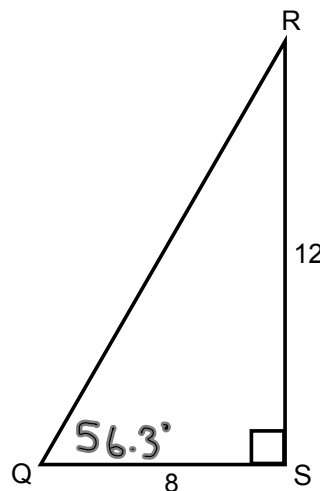
$$1) QR^2 = 8^2 + 12^2$$

$$\sqrt{QR^2} = \sqrt{208}$$

$$QR = 14.4$$

$$3) 56.3 + 90 = 146.3$$

$$180 - 146.3$$



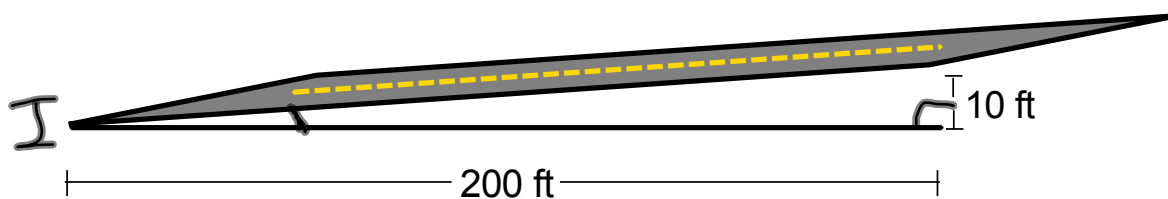
$$2) \tan Q = \frac{12}{8}$$

$$m\angle Q = \tan^{-1}\left(\frac{12}{8}\right)$$

$$m\angle Q = 56.3^\circ$$

Using Angles in Application

A road rises 10 feet in a horizontal distance of 200 feet. What is the angle of inclination?



$$\tan I = \frac{10}{200}$$

$$m\angle I = \tan^{-1}\left(\frac{1}{20}\right)$$

$$m\angle I = 2.9^\circ$$

Homework Assignment

Worksheet 7.7B

