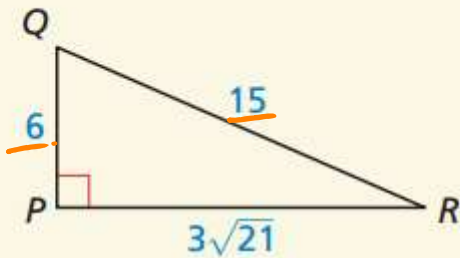


What You Will Learn

- ▶ Use inverse trigonometric ratios.
- ▶ Solve right triangles.

Determine which of the two acute angles has a sine of 0.4.



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$$\sin R = \frac{\text{opp}}{\text{hyp}} = \frac{6}{15} = 0.4$$

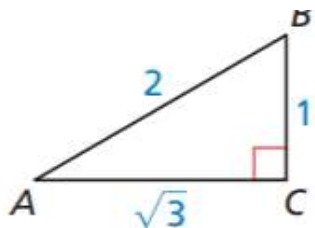
$\angle R$

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



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$\angle B$



$$\cos B = \frac{1}{2}$$

$$\frac{3x}{3} = \frac{9}{3}$$

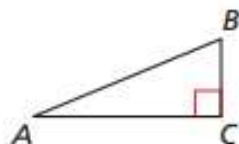
$$x = 3$$

$$x - 3 = 5$$

$$+3 \quad +3$$

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

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

$$\sin 28 = .4695$$

$$\sin^{-1} .4695 = 28.002$$

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. $\tan A = 3.29$

b. $\sin B = 0.55$

c. $\cos C = 0.87$

$\tan A = 3.29$

~~$\tan A = \tan^{-1} 3.29$~~

$A = 73.09 \approx 73.1^\circ$

$\sin B = .5500$

~~$\sin B = \sin^{-1} .5500$~~

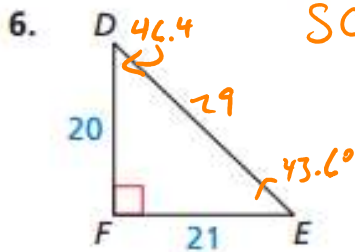
$B = 33.4^\circ$

$\cos C = .87$

~~$\cos C = \cos^{-1} .87$~~

$C = 29.5^\circ$

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



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$\tan E = \frac{20}{21}$

~~$\tan E = \tan^{-1} \frac{20}{21}$~~

$E = 43.6^\circ$

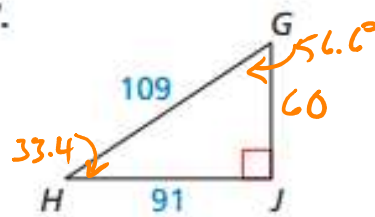
$\sin D = \frac{21}{x}$

$\sin 46.4 = \frac{21}{x}$

$x \cdot .7242 = \frac{21}{x}$

$\frac{.7242x}{.7242} = \frac{21}{.7242}$

$x = 29$



$90 - 56.6$

33.4

$\cos G = \frac{x}{109}$

$\cos 56.6 = \frac{x}{109}$

$109 \left(.5505 \right) \left(\frac{x}{109} \right) = 109 \cdot .5505$

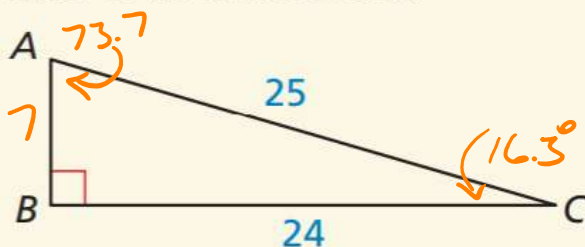
$60 = x$

$\sin G = \frac{91}{109}$

~~$\sin G = \sin^{-1} \frac{91}{109}$~~

$G = 56.6$

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



$\cos C = \frac{24}{25}$

$\cos^{-1} \cos C = \cos^{-1} \frac{24}{25}$

$C = 16.3$

$$\begin{aligned}\cos A &= \frac{x}{25} \\ \cos 73.7 &= \frac{x}{25} \\ 25(.2807) &= \left(\frac{x}{25}\right) 25 \\ 7 &= x\end{aligned}$$

Practice sec 9.6 pg.
505: 1-3A,
5-19EO, 33-36A
