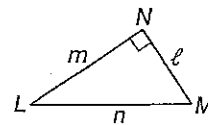


7-4 Practice

Trigonometry

Use $\triangle LMN$ to find $\sin L$, $\cos L$, $\tan L$, $\sin M$, $\cos M$, and $\tan M$. Express each ratio as a fraction and as a decimal to the nearest hundredth.



1. $l = 15, m = 36, n = 39$

Use a calculator to find each value. Round to the nearest ten-thousandth.

3. $\sin 92.4$

4. $\tan 27.5$

5. $\cos 64.8$

Find the measure of each acute angle to the nearest tenth of a degree.

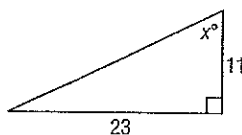
9. $\sin B = 0.7823$

10. $\tan A = 0.2356$

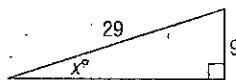
11. $\cos R = 0.6401$

Find x . Round to the nearest tenth.

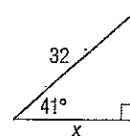
12.



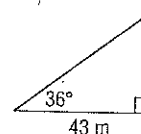
13.



14.



15. **GEOGRAPHY** Diego used a theodolite to map a region of land for his class in geomorphology. To determine the elevation of a vertical rock formation, he measured the distance from the base of the formation to his position and the angle between the ground and the line of sight to the top of the formation. The distance was 43 meters and the angle was 36 degrees. What is the height of the formation to the nearest meter?



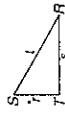
NAME _____ DATE _____ PERIOD _____
7-4 Study Guide and Intervention
Trigonometry

Trigonometric Ratios The ratio of the lengths of two sides of a right triangle is called a **trigonometric ratio**. The three most common ratios are sine, cosine, and tangent, which are abbreviated *sin*, *cos*, and *tan*, respectively.

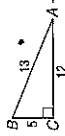
$$\sin R = \frac{\text{leg opposite } \angle R}{\text{hypotenuse}} = \frac{o}{h}$$

$$\cos R = \frac{\text{leg adjacent to } \angle R}{\text{hypotenuse}} = \frac{a}{h}$$

$$\tan R = \frac{\text{leg opposite } \angle R}{\text{leg adjacent to } \angle R} = \frac{o}{a}$$



Example Find *sin A*, *cos A*, and *tan A*. Express each ratio as a decimal to the nearest thousandth.

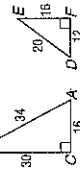
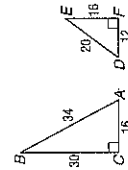


$$\begin{aligned} \sin A &= \frac{\text{opposite leg}}{\text{hypotenuse}} = \frac{BC}{AB} = \frac{5}{13} \approx 0.385 \\ \cos A &= \frac{\text{adjacent leg}}{\text{hypotenuse}} = \frac{AC}{AB} = \frac{12}{13} \approx 0.923 \\ \tan A &= \frac{\text{opposite leg}}{\text{adjacent leg}} = \frac{BC}{AC} = \frac{5}{12} \approx 0.417 \end{aligned}$$

Exercises

Find the indicated trigonometric ratio as a fraction and as a decimal. If necessary, round to the nearest ten-thousandth.

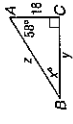
- $\sin A = \frac{15}{17}$; 0.8824
- $\tan B = \frac{8}{15}$; 0.5333
- $\cos A = \frac{8}{17}$; 0.4706
- $\cos B = \frac{15}{17}$; 0.8824
- $\sin D = \frac{4}{5}$; 0.8
- $\tan E = \frac{3}{4}$; 0.75
- $\cos E = \frac{4}{5}$; 0.8
- $\cos D = \frac{3}{5}$; 0.6



NAME _____ DATE _____ PERIOD _____
7-4 Study Guide and Intervention
Trigonometry

Use Trigonometric Ratios In a right triangle, if you know the measures of two sides or if you know the measures of one side and an acute angle, then you can use trigonometric ratios to find the measures of the missing sides or angles of the triangle.

Example Find *x*, *y*, and *z*. Round each measure to the nearest whole number.



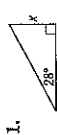
a. Find *x*.
 $x + 58 = 90$
 $x = 32$

b. Find *y*.
 $\tan A = \frac{y}{16}$
 $\tan 58^\circ = \frac{y}{16}$
 $y = 18 \tan 58^\circ$
 $y \approx 29$

c. Find *z*.
 $\cos A = \frac{18}{z}$
 $\cos 58^\circ = \frac{18}{z}$
 $z \cos 58^\circ = 18$
 $z = \frac{18}{\cos 58^\circ}$
 $z \approx 34$

Exercises

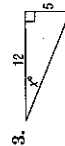
Find *x*. Round to the nearest tenth.



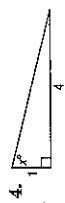
17.0



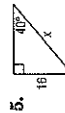
48.6



22.6



76.0



24.9



34.2