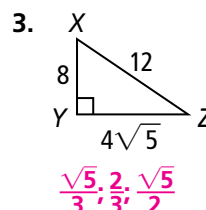
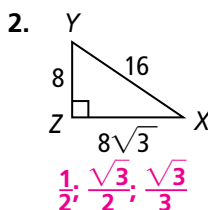
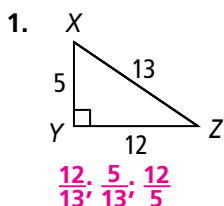


Practice

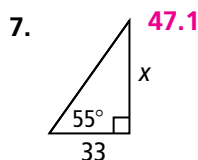
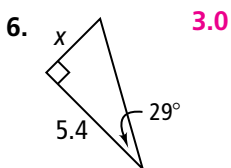
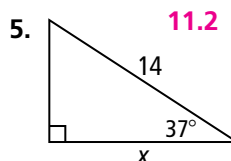
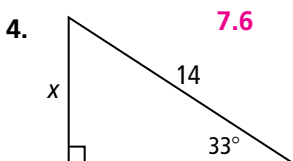
Form G

Trigonometry

Write the ratios for $\sin X$, $\cos X$, and $\tan X$.



Find the value of x . Round to the nearest tenth.

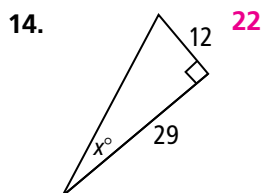
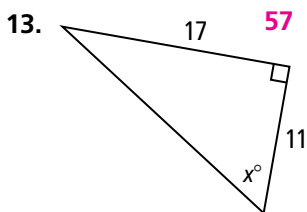
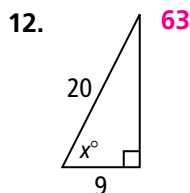
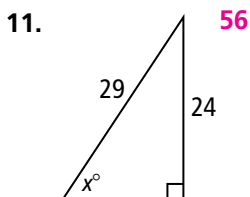


8. An escalator at a shopping center is 200 ft 9 in. long, and rises at an angle of 15° . What is the vertical rise of the escalator? Round to the nearest inch. **51 ft 11 in., or 623 in.**

9. A 12-ft-long ladder is leaning against a wall and makes a 77° angle with the ground. How high does the ladder reach on the wall? Round to the nearest inch. **11 ft 8 in., or 140 in.**

10. A straight ramp rises at an angle of 25.5° and has a base 30 ft long. How high is the ramp? Round to the nearest foot. **14 ft**

Find the value of x . Round to the nearest degree.



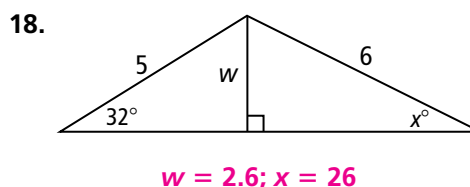
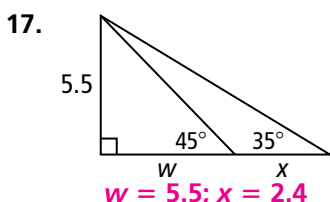
Practice (continued)

Form G

Trigonometry

15. The lengths of the diagonals of a rhombus are 4 in. and 7 in. Find the measures of the angles of the rhombus to the nearest degree. **59 and 121**
16. The lengths of the diagonals of a rhombus are 5 in. and 8 in. Find the measures of the angles of the rhombus to the nearest degree. **64 and 116**

Find the values of w and then x . Round lengths to the nearest tenth and angle measures to the nearest degree.



19. **Writing** Explain why $\tan 45^\circ = 1$. **Answers may vary. Sample: The tangent of an angle is the length of the opposite leg divided by the length of the adjacent side. If the angle is 45° , then the opposite side and the adjacent sides are equal.**

The sine, cosine, and tangent ratios each have a reciprocal ratio. The reciprocal ratios are cosecant (csc), secant (sec), and cotangent (cot). Use $\triangle DEF$ and the definitions below to write each ratio.

$\csc X = \frac{1}{\sin X}$

$\sec X = \frac{1}{\cos X}$

$\cot X = \frac{1}{\tan X}$

20. $\csc D = \frac{9}{8}$

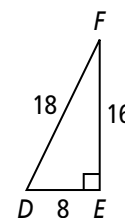
21. $\sec D = \frac{9}{4}$

22. $\cot D = \frac{1}{2}$

23. $\csc F = \frac{9}{4}$

24. $\sec F = \frac{9}{8}$

25. $\cot F = 2$



26. An *identity* is an equation that is true for all the allowed values of the variable.

Use what you know about trigonometric ratios to show that the equation

$\cot X = \frac{\cos X}{\sin X}$ is an identity. **$\cot X = \frac{1}{\tan X}$ and $\tan X = \frac{\sin X}{\cos X}$, so $\frac{1}{\tan X} = \frac{1}{\frac{\sin X}{\cos X}} = \frac{\cos X}{\sin X}$**

27. **Reasoning** Does $\sin A + \sin B = \sin (A + B)$ when $0 < A + B < 90$?

Explain your reasoning. **No; answers may vary. Sample: $\sin 45 + \sin 30 = 0.707 + 0.5$ and $\sin (40 + 35) = \sin 75 = .966$.**

28. A right triangle has a hypotenuse of length 10 and one leg of length 7. Find the length of the other leg and the measures of the acute angles in the triangle.

Round your answers to the nearest tenth **7.1; 45.6; 44.4**

29. A right triangle has an angle that measures 28° . The leg opposite the 28° angle measures 13. Find the length of the other leg and the hypotenuse. Round your answers to the nearest tenth. **24.4; 27.7**