Write

Draw and label right triangle *PQR* with $\angle Q = 90°$. Then describe the sine ratio in terms of $\angle R$ and $\angle P$.

Remember

The sine of an acute angle in a right triangle is the ratio of the length of the side that is opposite the angle to the length of the hypotenuse. The cosecant of an acute angle is the inverse of the sine of the same angle. The inverse sine of *x*, or $\sin^{-1} x$, can be used to determine the measure of an acute angle whose sine is *x*.
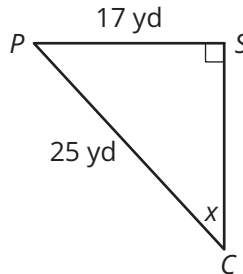
Practice

1. Use the sine ratio, the cosecant ratio, or the inverse sine to solve for *x*. Round each answer to the nearest tenth.
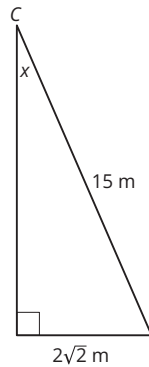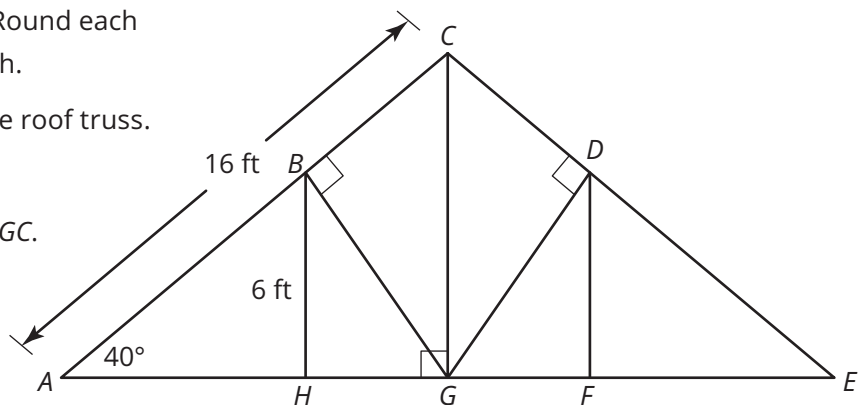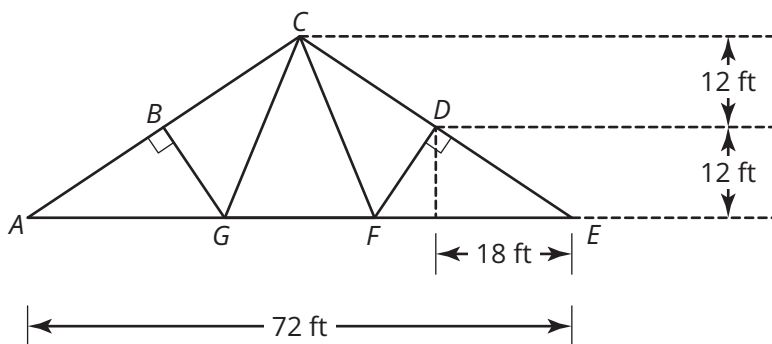
a.

b. 17 yd
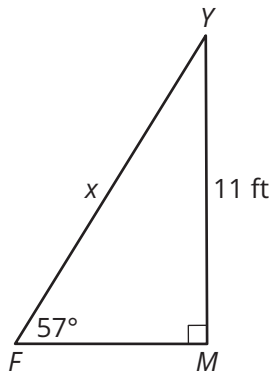
c.

2. Consider the roof truss shown. Round each answer to the nearest hundredth.

   a. Determine the height *CG* of the roof truss.

   b. Determine length *AB*.

   c. Determine the measure of $\angle BGC$.

   d. Determine length *BG* of the support beam.

Stretch

1. A roof truss is shown in the figure. Round each answer to the nearest hundredth.

a. Determine the length *DF* of the support beam.

b. Determine the measure of ∠*DFE*.

c. Determine the length *CF* of the support beam.

d. Determine the measure of angle *DCF*.

Review

1. Calculate the tangent of the indicated angle in the triangle. Write your answer in simplest form.

2. Use a calculator to approximate cot 50°. Round your answer to the nearest hundredth.
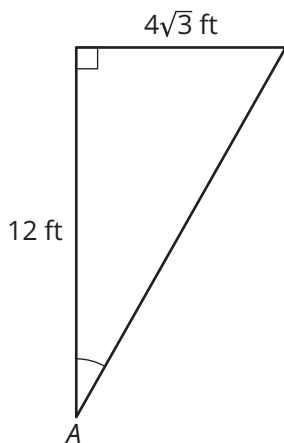
3. The figure shows a truss on a bridge. Segment *KM* bisects ∠*JKN*. Use this information to calculate *MN* and *MJ*.
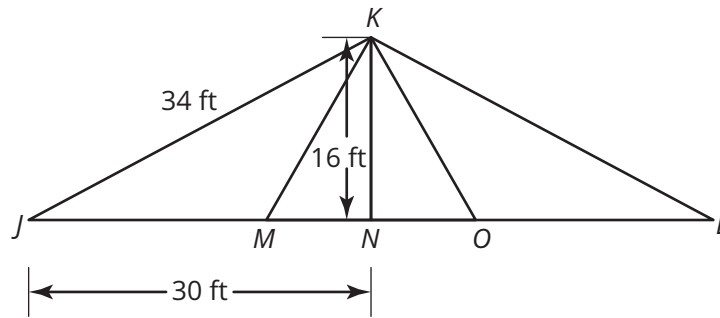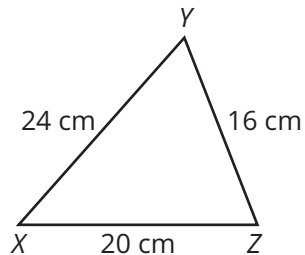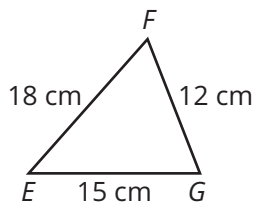

4. Use the Triangle Proportionality Theorem and the Proportional Segments Theorem to determine the unknown value.
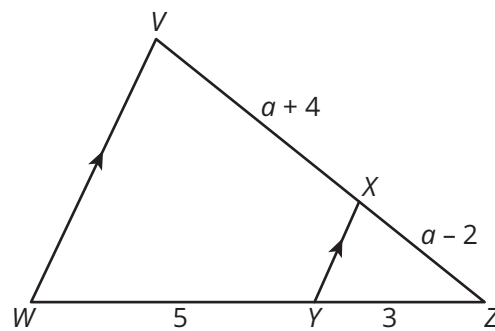
5. Determine whether the triangles are similar. If so, write a similarity statement. Explain your reasoning.

a.

b.