



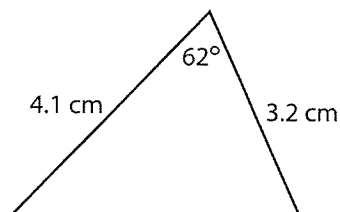
Evaluate: Homework and Practice



- Online Homework
- Hints and Help
- Extra Practice

Find the area of each triangle to the nearest tenth.

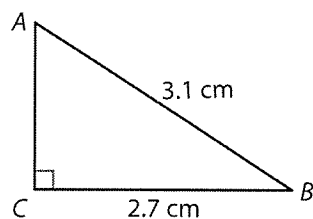
1.



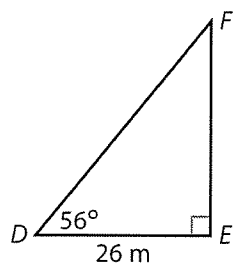
2. In $\triangle PQR$, $PR = 23$ mm, $QR = 39$ mm, and $m\angle R = 163^\circ$.

Solve each right triangle. Round lengths to the nearest tenth and angles to the nearest degree.

3.



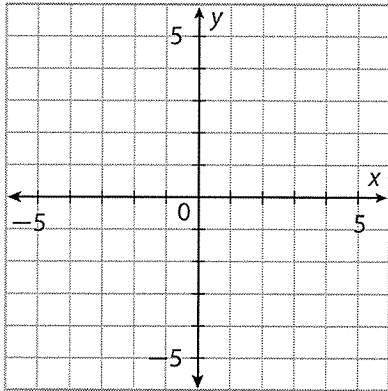
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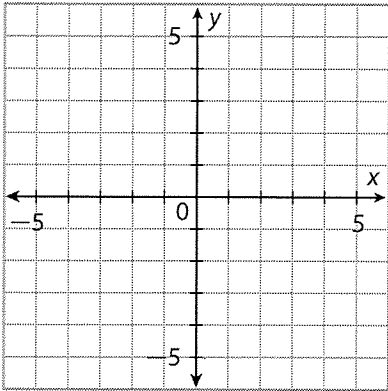
5. Right $\triangle PQR$ with $\overline{PQ} \perp \overline{PR}$, $QR = 47$ mm, and $m\angle Q = 52^\circ$

Solve each triangle. Find the side lengths to the nearest hundredth and the angle measures to the nearest degree.

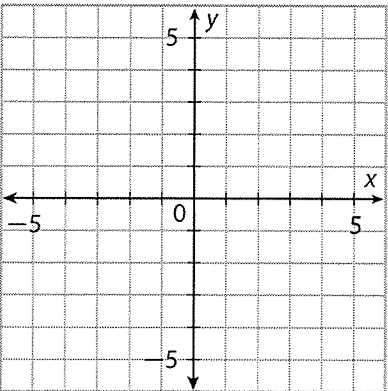
6. Triangle ABC with vertices $A(-4, 4)$, $B(3, 4)$, and $C(3, -2)$



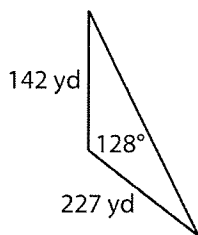
7. Triangle JKL with vertices $J(-3, 1)$, $K(-1, 4)$, and $L(6, -5)$



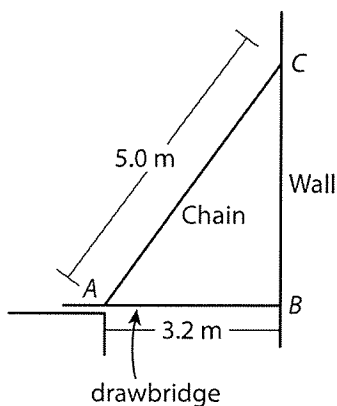
8. Triangle PQR with vertices $P(5, 5)$, $Q(-5, 3)$, and $R(-4, -2)$



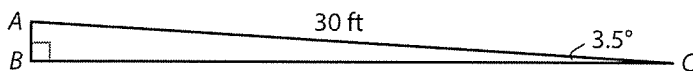
9. **Surveying** A plot of land is in the shape of a triangle, as shown. Find the area of the plot, to the nearest hundred square yards.



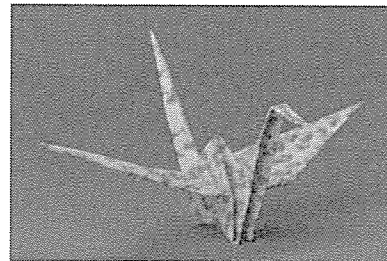
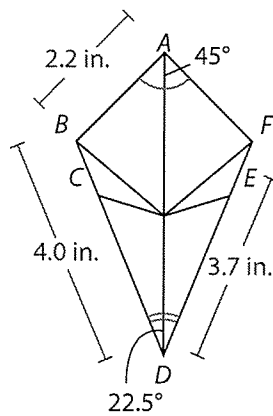
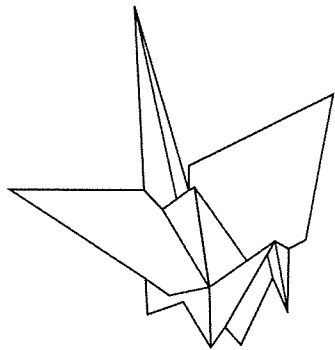
10. **History** A drawbridge at the entrance to an ancient castle is raised and lowered by a pair of chains. The figure represents the drawbridge when flat. Find the height of the suspension point of the chain, to the nearest tenth of a meter, and the measures of the acute angles the chain makes with the wall and the drawbridge, to the nearest degree.



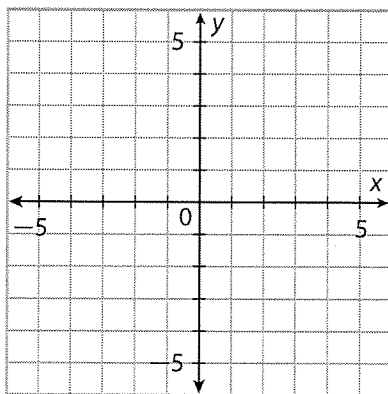
11. **Building** For safety, the angle a wheelchair ramp makes with the horizontal should be no more than 3.5° . What is the maximum height of a ramp of length 30 ft? What distance along the ground would this ramp cover? Round to the nearest tenth of a foot.



- 12. Multi-Step** The figure shows an origami crane as well as a stage of its construction. The area of each wing is shown by the shaded part of the figure, which is symmetric about its vertical center line. Use the information in the figure to find the total wing area of the crane, to the nearest tenth of a square inch.

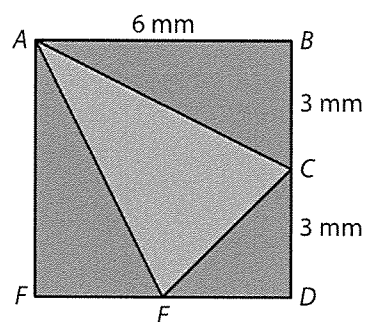


- 13.** Right triangle $\triangle XYZ$ has vertices $X(1, 4)$ and $Y(2, -3)$. The vertex Z has positive integer coordinates, and $XZ = 5$. Find the coordinates of Z and solve $\triangle XYZ$; give exact answers.

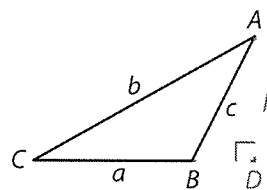


14. Critique Reasoning Shania and Pedro are discussing whether it is always possible to solve a right triangle, given enough information, without using the Pythagorean Theorem. Pedro says that it is always possible, but Shania thinks that when two side lengths and no angle measures are given, the Pythagorean Theorem is needed. Who is correct, and why?

15. Design The logo shown is symmetrical about one of its diagonals. Find the angle measures in $\triangle CAE$, to the nearest degree. (*Hint*: First find an angle in $\triangle ABC$, $\triangle CDE$ or $\triangle AEF$) Then, find the area of $\triangle CAE$, without first finding the areas of the other triangles.



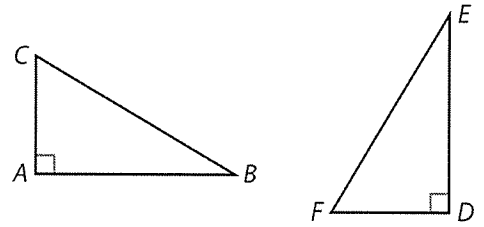
16. Use the area formula for obtuse $\angle B$ in the diagram to show that if an acute angle and an obtuse angle are supplementary, then their sines are equal.



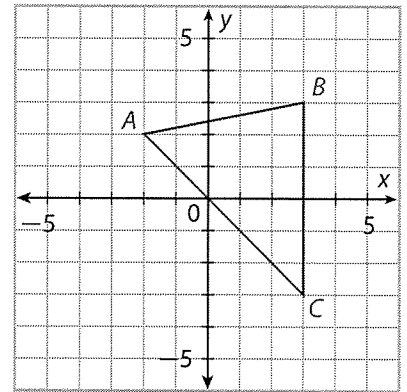
H.O.T. Focus on Higher Order Thinking

- 17. Communicate Mathematical Ideas** The HL Congruence Theorem states that for right triangles ABC and DEF such that $\angle A$ and $\angle D$ are right angles, $\overline{BC} \cong \overline{EF}$, and $\overline{AB} \cong \overline{DE}$, $\triangle ABC \cong \triangle DEF$.

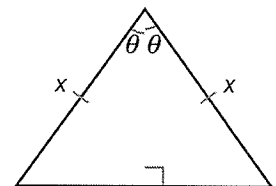
Explain, without formal proof, how solving a right triangle with given leg lengths, or with a given side length and acute angle measure, shows that right triangles with both legs congruent, or with corresponding sides and angles congruent, must be congruent.



- 18. Persevere in Problem Solving** Find the perimeter and area of $\triangle ABC$, as exact numbers. Then, find the measures of all the angles to the nearest degree.



- 19. Analyze Relationships** Find the area of the triangle using two different formulas, and deduce an expression for $\sin 2\theta$.



Lesson Performance Task

Every molecule of water contains two atoms of hydrogen and one atom of oxygen. The drawing shows how the atoms are arranged in a molecule of water, along with the incredibly precise dimensions of the molecule that physicists have been able to determine. (1 pm = 1 picometer = 10^{-12} m)

1. Draw and label a triangle with the dimensions shown.
2. Find the area of the triangle in square centimeters. Show your work.
3. Find the distance between the hydrogen atoms in centimeters. Explain your method.

