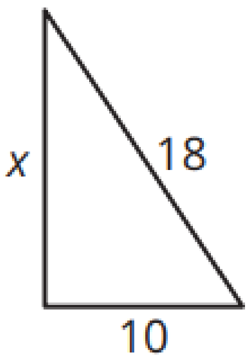
Warm Up

Solve for *x* in each right triangle.

1.



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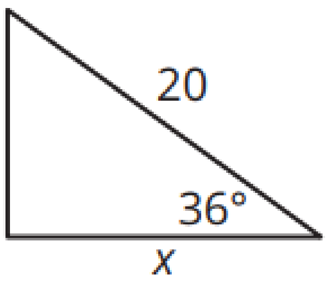

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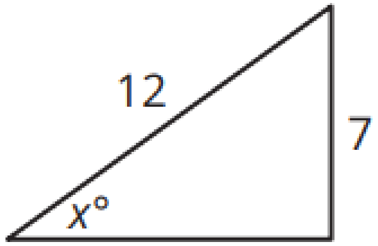
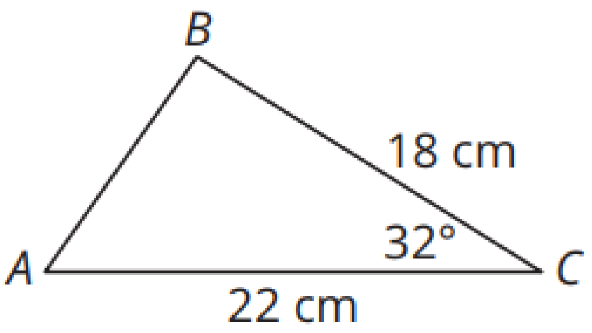


Whether you are determining the area of a right triangle, solving for the unknown side lengths of a right triangle, or solving for the unknown angle measurements in a right triangle, the solution paths are fairly straightforward. You can use what you learned previously, such as the area formula for a triangle, the Pythagorean Theorem, and the Triangle Sum Theorem.

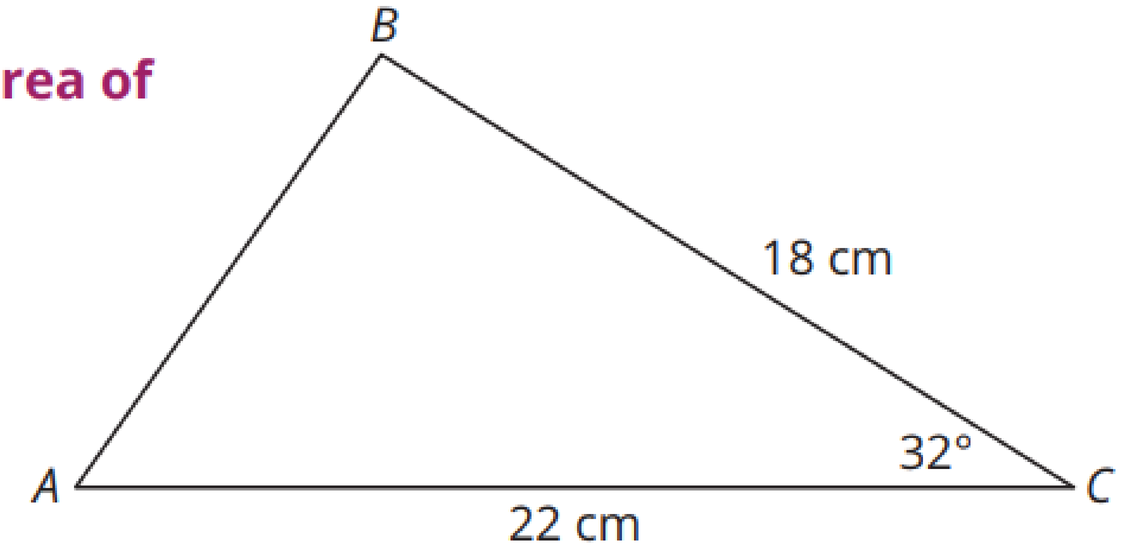


1. Consider $\triangle ABC$ as shown.

a. Can you use the area formula to determine the area of the triangle? Explain your reasoning.

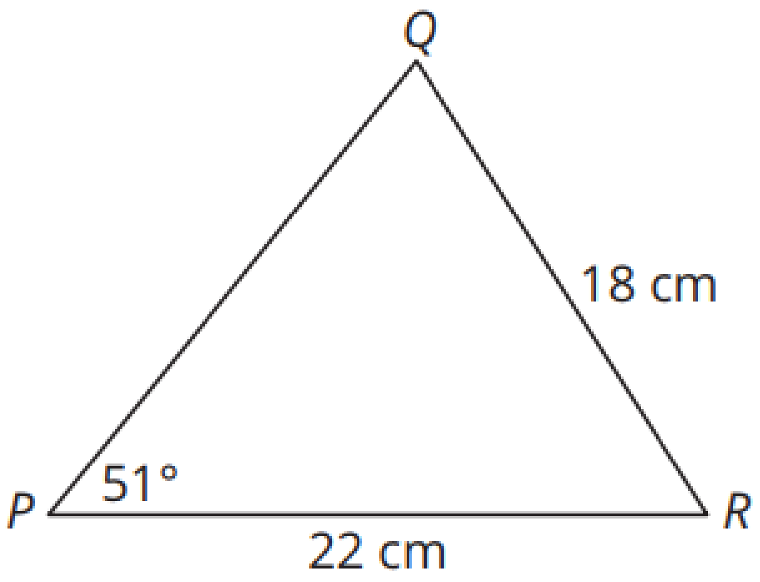
The area formula $A = \frac{1}{2}ab \cdot \sin C$ can be used to determine the area of any triangle if you know the lengths of two sides and the measure of the included angle.

2. Use a trigonometric ratio to determine the area of the triangle.



The **Law of Sines**, or $\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$, can be used to determine the unknown side lengths or the unknown angle measures in *any* triangle.

4. Use the Law of Sines to determine the measure of $\angle Q$.



5. In $\triangle ABC$, side c measures 35 inches, side b measures 28 inches, and $m\angle B = 40°$. Taggert calculated $m\angle C$ as shown.

$$\frac{\sin 40}{28} = \frac{\sin C}{35}$$

$$35 \cdot \sin 40 = 28 \cdot \sin C$$

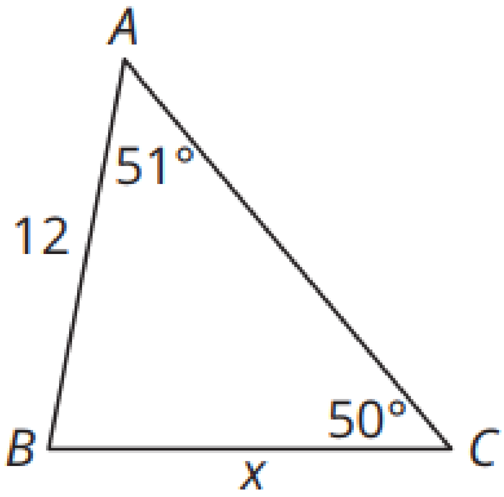
$$22.5 \approx 28 \cdot \sin C$$

$$\sin C \approx 0.8 \text{ and } \sin^{-1} C \approx 53.1°$$

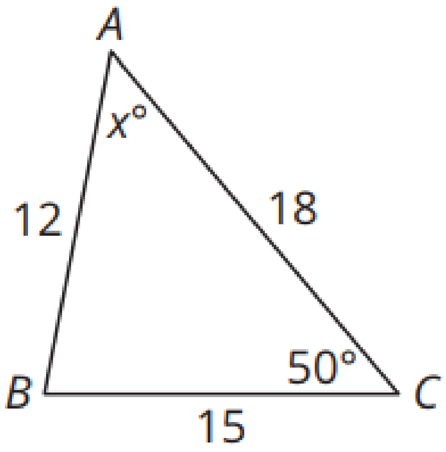
Since $180° - 53.1° = 126.9°$, the measure of angle C could be $53.1°$ or $126.9°$.

Is Taggert correct? Use a drawing to justify your reasoning.

a.



b.



d.