13.3 Special Right Triangles Name___________________________

Find the missing side lengths. Leave your answers in simplest radical form. Show all work including tic-tac-toe board.

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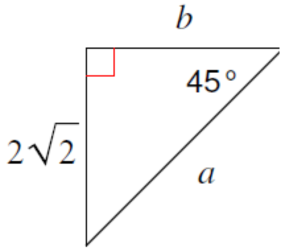

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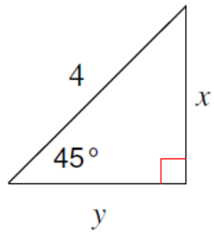

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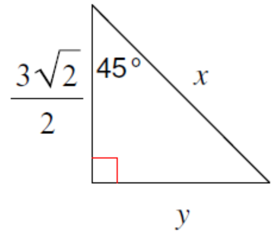

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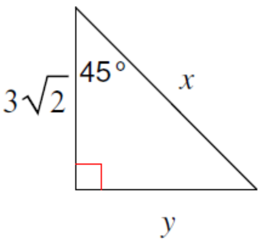

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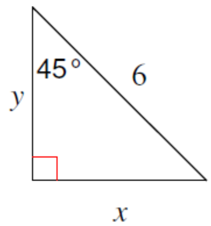

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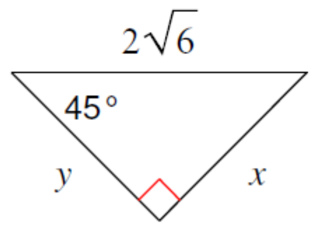

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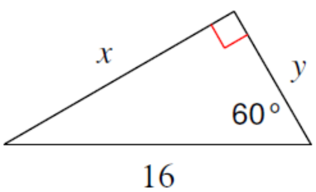

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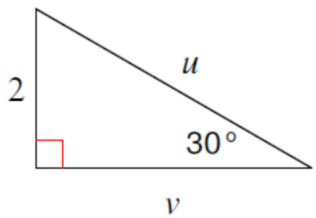

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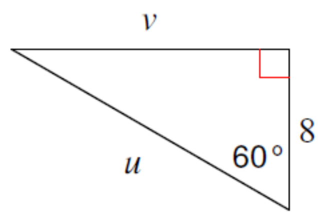

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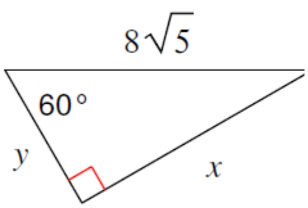

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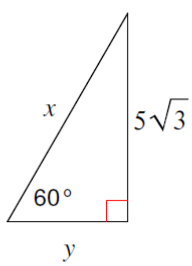

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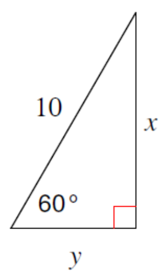

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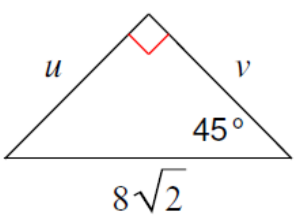

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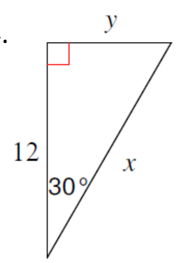

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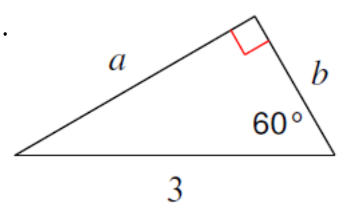

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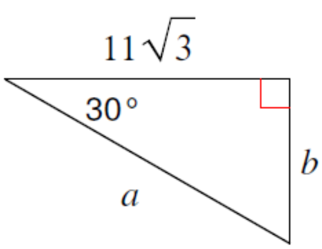

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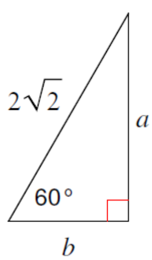

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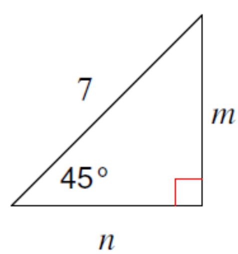
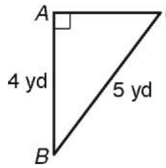


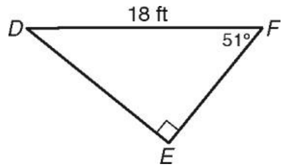
Use a calculator and inverse trigonometric ratios to find the unknown side lengths and angle measures. Round lengths to the nearest hundredth and angle measures to the nearest degree.

1. 

$AC =$ __________

$m\angle B =$ __________

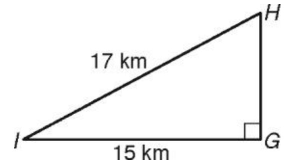
$m\angle C =$ __________

2. 

$DE =$ __________

$EF =$ __________

$m\angle D =$ __________

3. 

$GH =$ __________

$m\angle H =$ __________

$m\angle I =$ __________

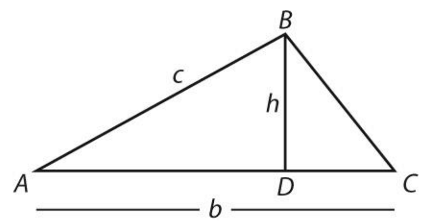
If you know two side lengths and the included angle of any triangle, you can use trigonometry to find the area. For Problems 4–7, follow the steps to derive an area formula, and then apply the formula to find the areas.

Area of a Triangle

$$A = \frac{1}{2}\text{base} \times \text{height}$$

4. If you know AB and the measure of $\angle A$, you can find the height of the triangle. Write a trigonometric equation to relate $\angle A$, h, and c. ____________

5. Solve for h. $h =$ _______ Substitute your value for h into the formula for area of a triangle. ____________

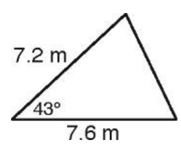


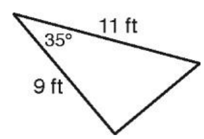
6. If $b = 13$, $c = 10$, and $m\angle A = 28°$, what is the area of ΔABC, to the nearest square unit? ____________________

7. Use the formula $A = \frac{1}{2}bc\sin A$ to find the area of each triangle.

   (b and c are the known side lengths and $\angle A$ is the included angle.)

   $A =$ _____________ $A =$ _____________

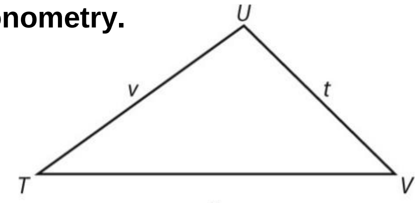




Follow the steps to find the area of the triangle using trigonometry.

8. Draw a line from vertex U perpendicular to the base $\overline{TV}$ at a point W. Label its length h. Write the sine of $\angle T$ as a ratio using variables in the figure. Solve for h. Then write the area of the triangle using your value for h.

   $\sin T = \frac{\boxed{}}{\boxed{}}$ $h =$ __________ $Area =$ ___________



9. What is the area of the triangle if $\angle T = 37°$, $u = 14$, and $v = 10$? __________________