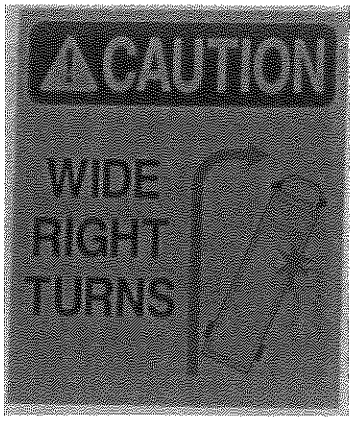
# 5.6 More Than Right

## *A Develop Understanding Task*



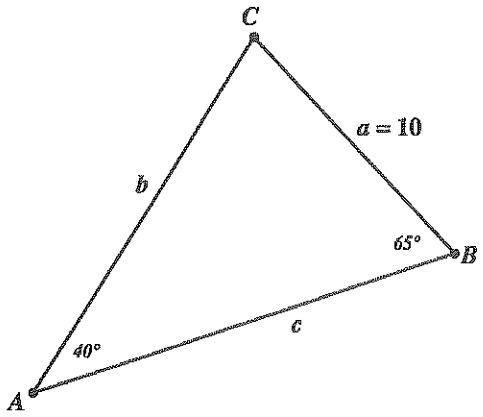



We can use right triangle trigonometry and the Pythagorean theorem to solve for missing sides and angles in a right triangle. What about other triangles? How might we find unknown sides and angles in acute or obtuse triangles if we only know a few pieces of information about them?

In the previous task we found it might be helpful to create right triangles by drawing an altitude in a non-right triangle. We can then apply trigonometry or the Pythagorean theorem to the smaller right triangles, which may help us learn something about the sides and angles in the larger triangle.

See if you can devise a strategy for finding the missing sides and angles of each of these triangles.

1.



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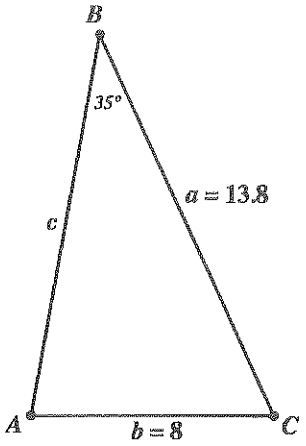
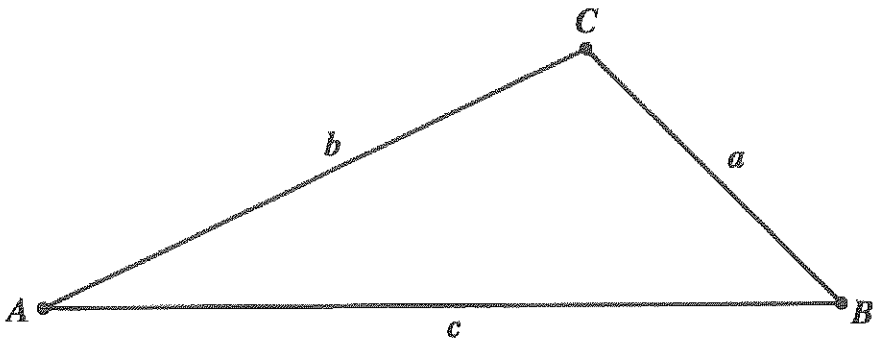



3. See if you can generalize the work you have done on problems 1 and 2 by finding relationships between sides and angles in the following diagram. Unlike the previous two problems, this triangle contains an obtuse angle at *C*. Find as many relationships as you can between sides *a*, *b* and *c* and the related angles *A*, *B* and *C*.



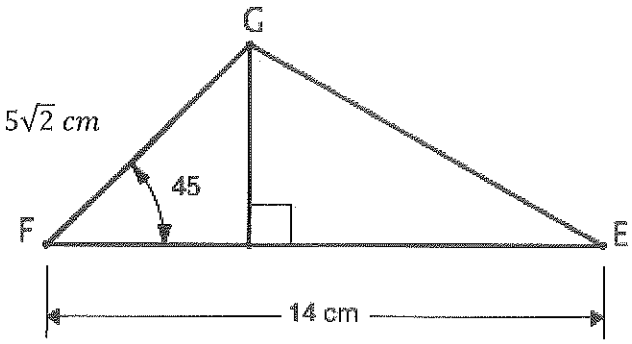
READY, SET, GO! Name Period Date

## READY

Topic: Finding area of triangles

**Find the area of each triangle.** $A = \frac{1}{2}bh$

1.

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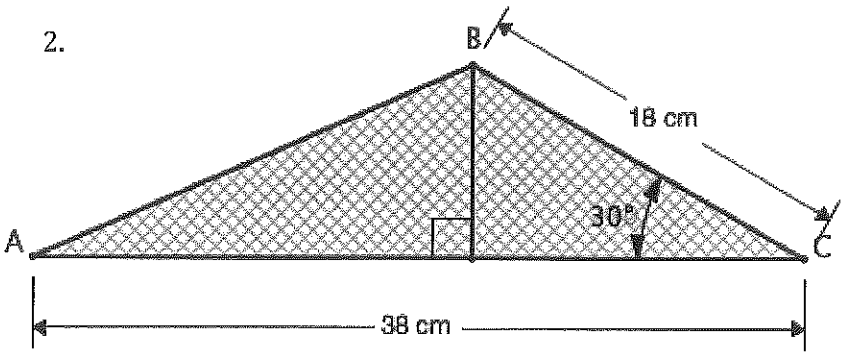


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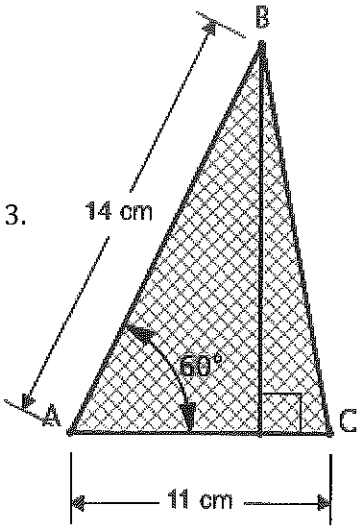
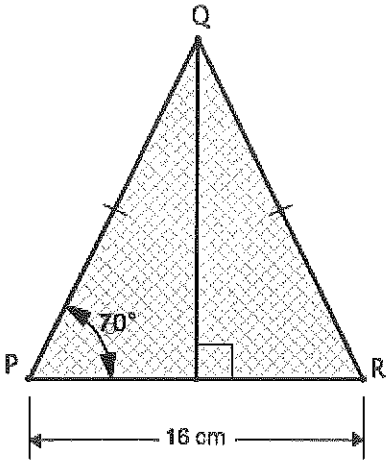



4.

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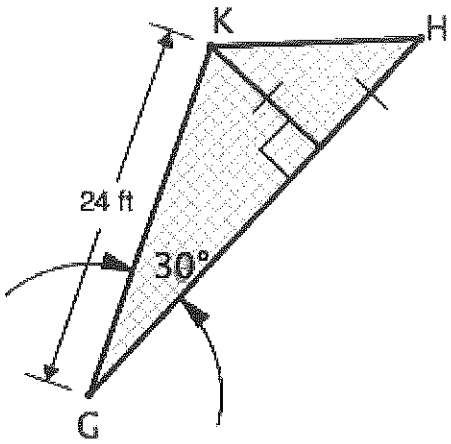
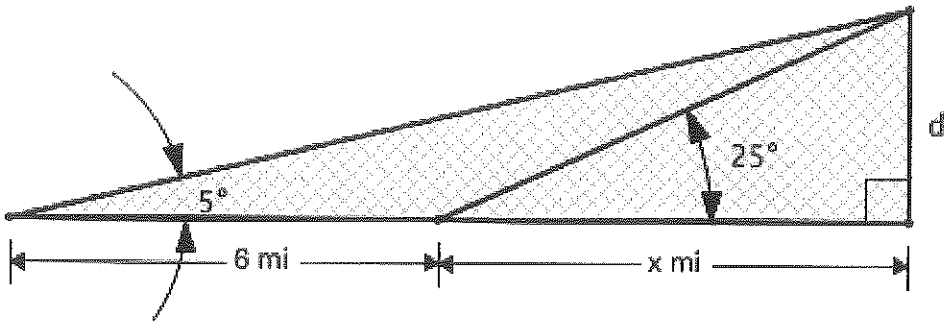


SET

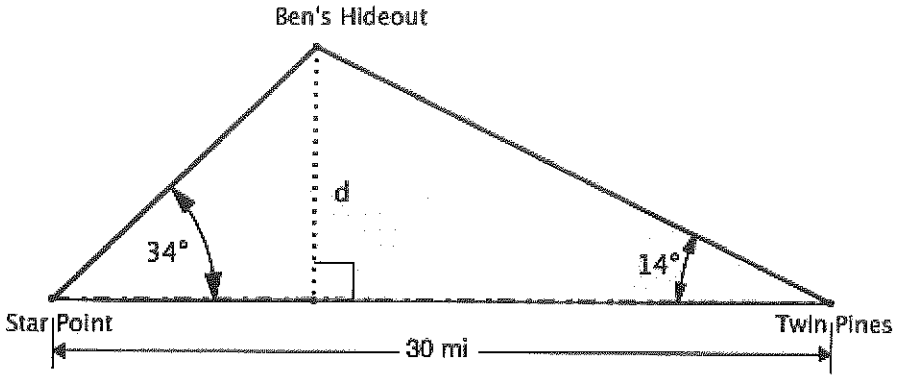
Topic: Using right triangle trig to solve triangles

**Solve the following application problems using right triangle trigonometry.**

6. While traveling across a flat stretch of desert, Joey and Holly make note of a mountain peak in the distance that seems to be directly in front of them. They estimate the angle of elevation to the peak as 5º. After traveling 6 miles towards the mountain the angle of elevation is 25º. Approximate the height of the mountain in miles and in feet. **5,280ft = 1 mile** (While figuring, use at least 4 decimal places.)




7. The Star Point Ranger Station and the Twin Pines Ranger Station are 30 miles apart along a straight scenic road. Each station gets word of a cabin fire in a remote area known as Ben's Hideout. A straight path from Star Point to the fire makes an angle of 34º with the road, while a straight path from Twin pines makes an angle of 14° with the road. Find the distance *d* of the fire from the road.

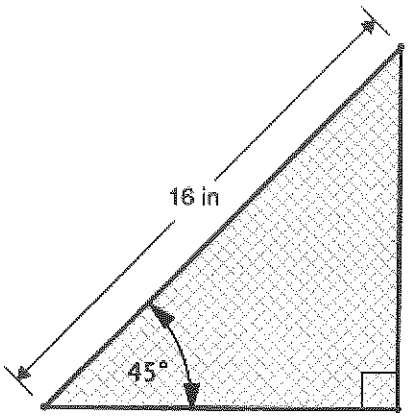


GO

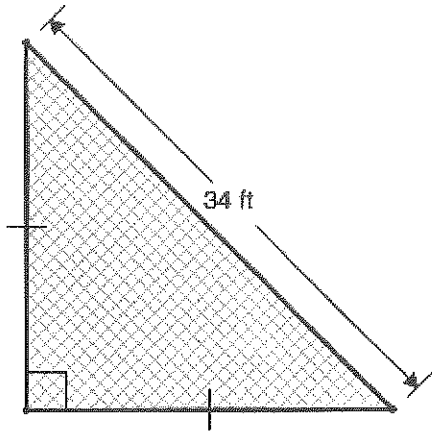
Topic: Recalling measures in special right triangles

**Fill in the missing sides and angles in the right triangles. Write answers in simplified radical form. Do NOT use a calculator.**

8.

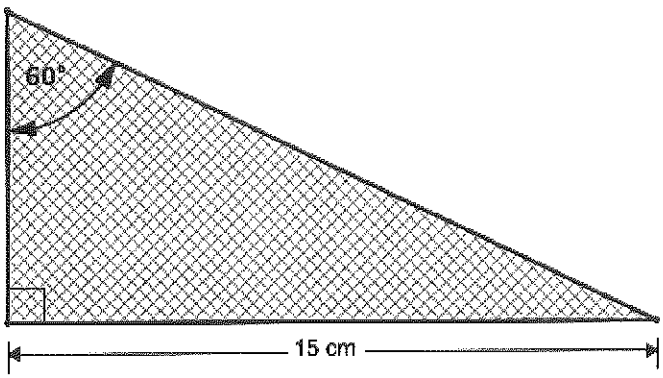



9.

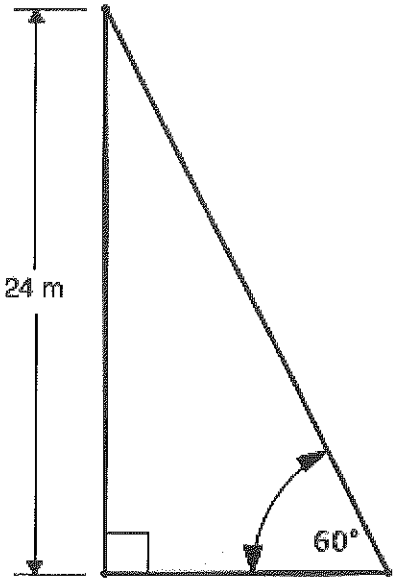



10. Write a rule for finding the sides of an isosceles right triangle when you know the hypotenuse and the measure of the hypotenuse does NOT show a $\sqrt{2}$.

11.



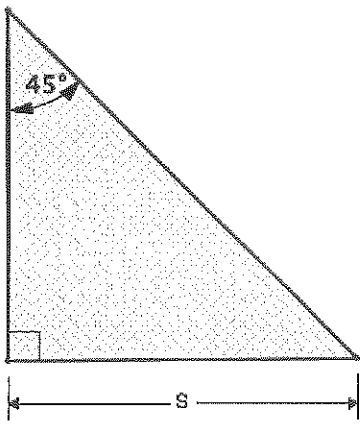

12.



13. Write a rule for finding the missing sides in a 30º - 60º - 90º when you know the side opposite the 60º angle but the measurement doesn't show a $\sqrt{3}$.

**Fill in the missing measurements.**

14.

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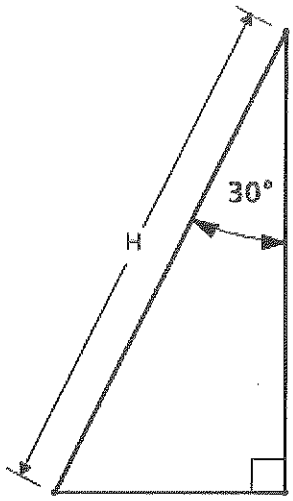


**Fill in the ratios for the given functions. Do not use a calculator. Answers should be in simplified radical form.**

16.

| | |
|---|---|
| sin 45° = | |
| cos 45° = | |
| tan 45° = | |

17.

| | |
|---|---|
| sin 30° = | |
| cos 30° = | |
| tan 30° = | |

18.

| | |
|---|---|
| sin 60° = | |
| cos 60° = | |
| tan 60° = | |