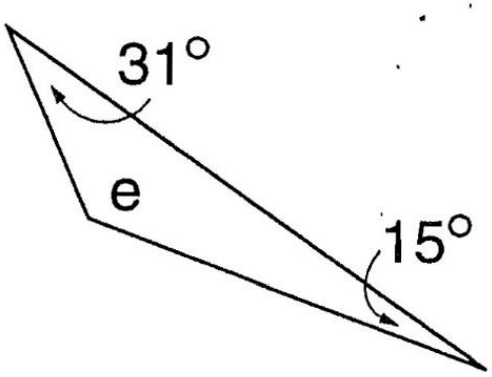
8.4

Using Similar Right Triangles

Review

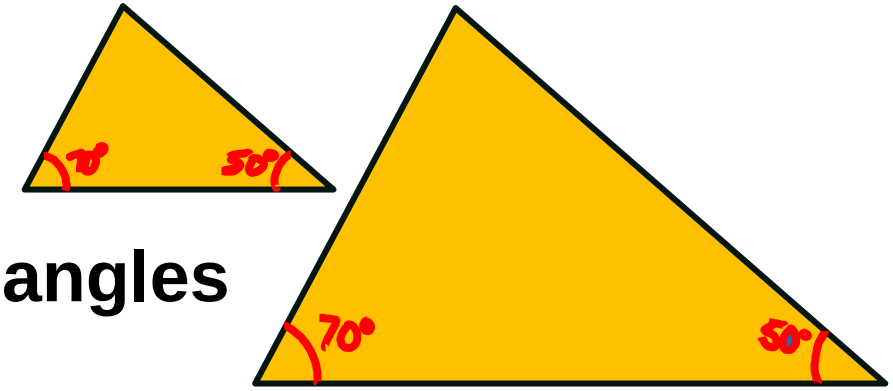
Triangle Sum Theorem

The _____ of all the _____ in a triangle is _____ .

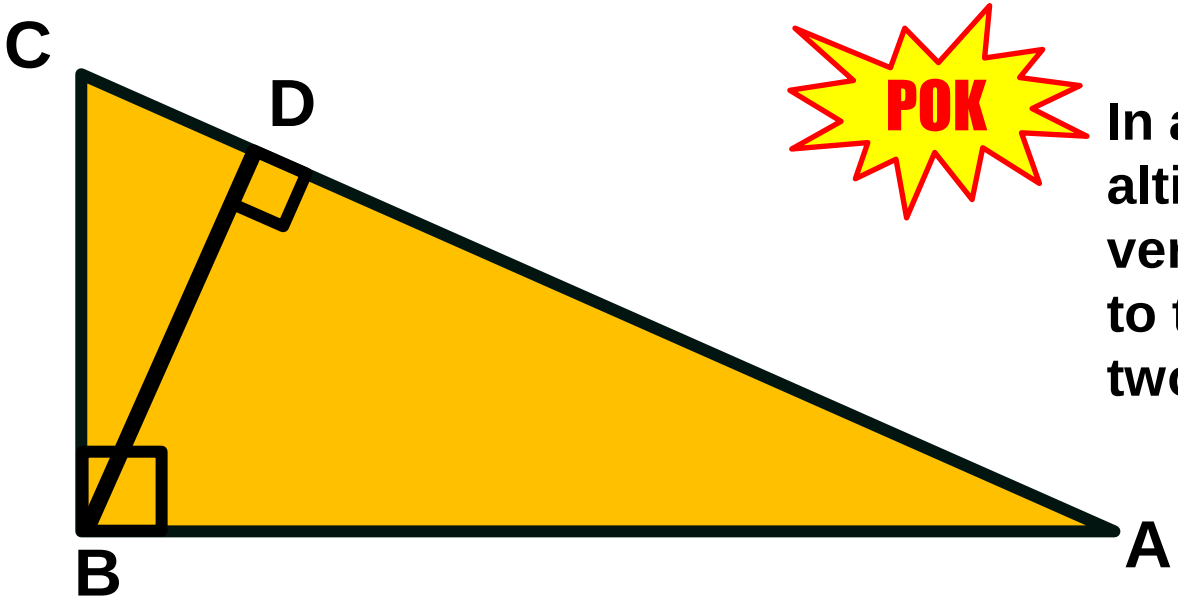


Angle-Angle Similarity Postulate

If __ angles in one triangle are congruent to ___ angles another triangle, then the triangles are _____ .



Right Triangle Similarity Theorem



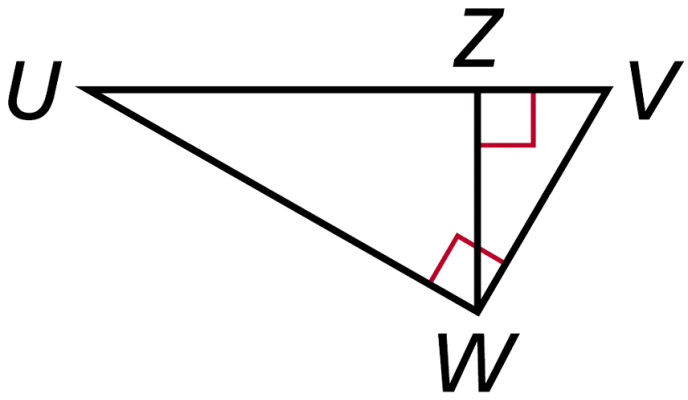
POK

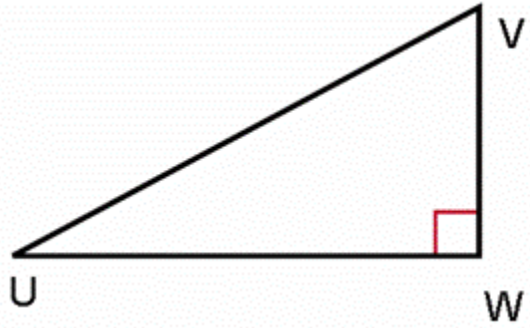
In a right triangle, an altitude drawn from the vertex of the right angle to the hypotenuse forms two right similar triangles.

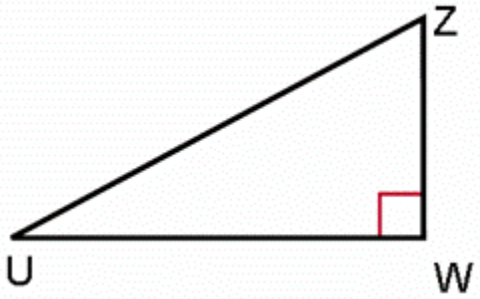
Sketch the triangles and then write a similarity statement comparing the triangles.

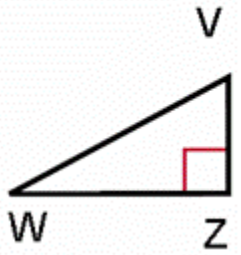
Practice 1

Write a similarity statement comparing the triangles. You may want to sketch the three right triangles to help you out.





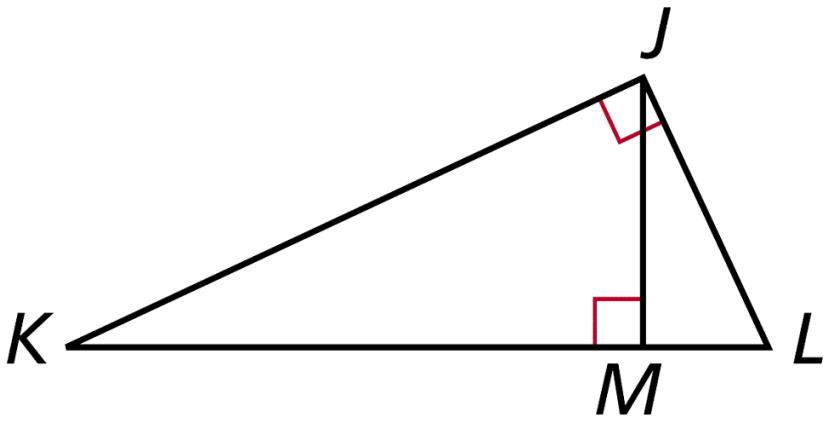


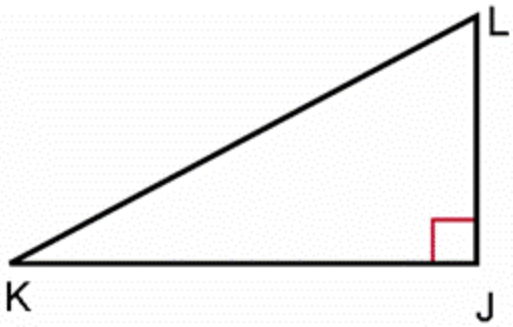


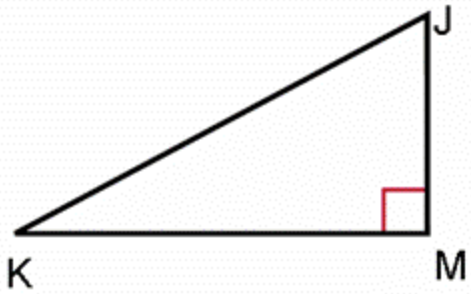
$\Delta UVW \sim \Delta UWZ \sim \Delta WVZ$

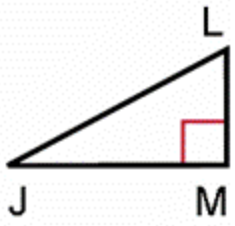
Practice 2

Write a similarity statement comparing the triangles. You may want to sketch the three right triangles to help you out.







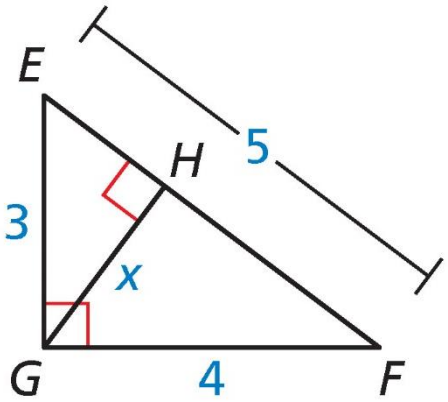


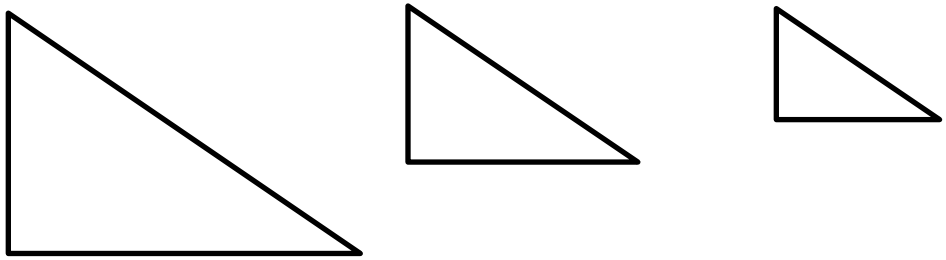
$\Delta LJK \sim \Delta JMK \sim \Delta LMJ.$

Using Similar Triangles to Find Missing Parts

Find the missing variable.

1)

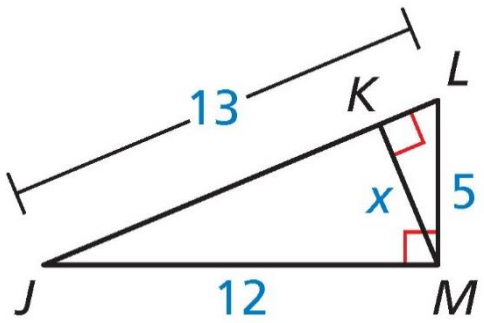


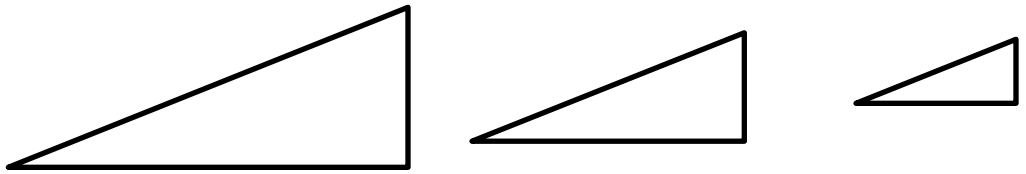


Using Similar Triangles to Find Missing Parts

Find the missing variable.

2)

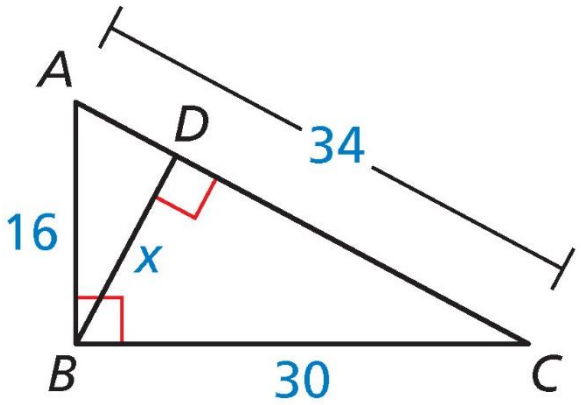




Using Similar Triangles to Find Missing Parts

Find the missing variable.

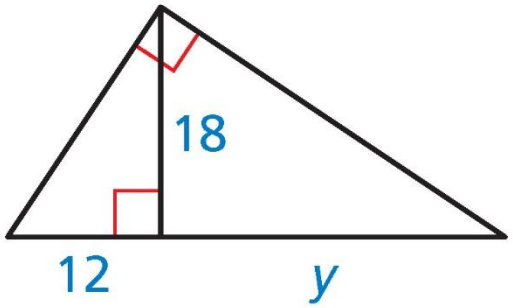
3)



Using Similar Triangles to Find Missing Parts

Find the missing variable.

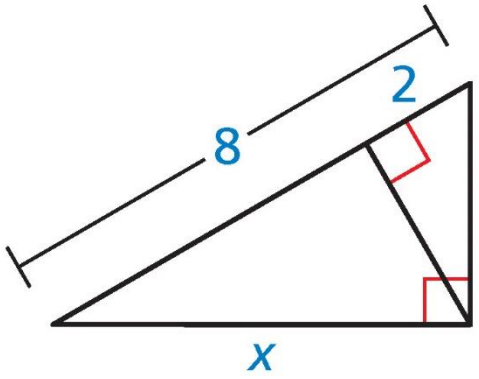
4)



Using Similar Triangles to Find Missing Parts

Find the missing variable.

5)

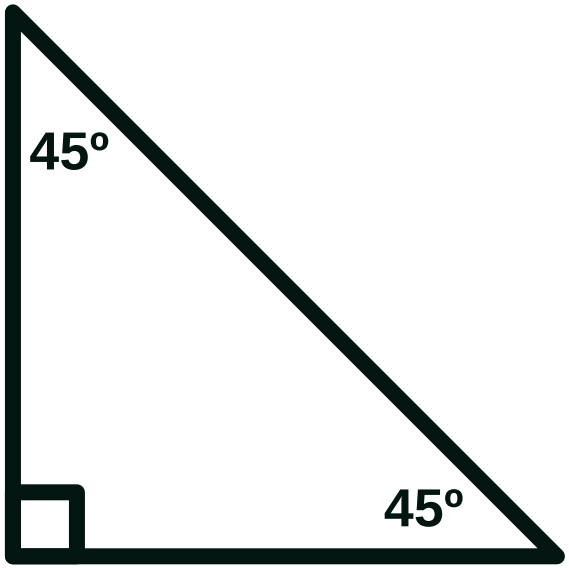


8.5

Special Right Triangles

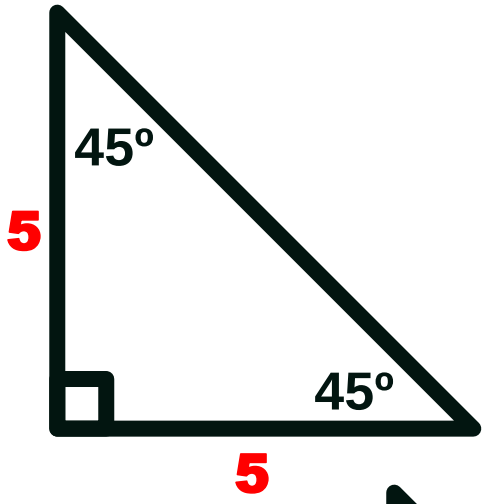
45-45-90 Triangle

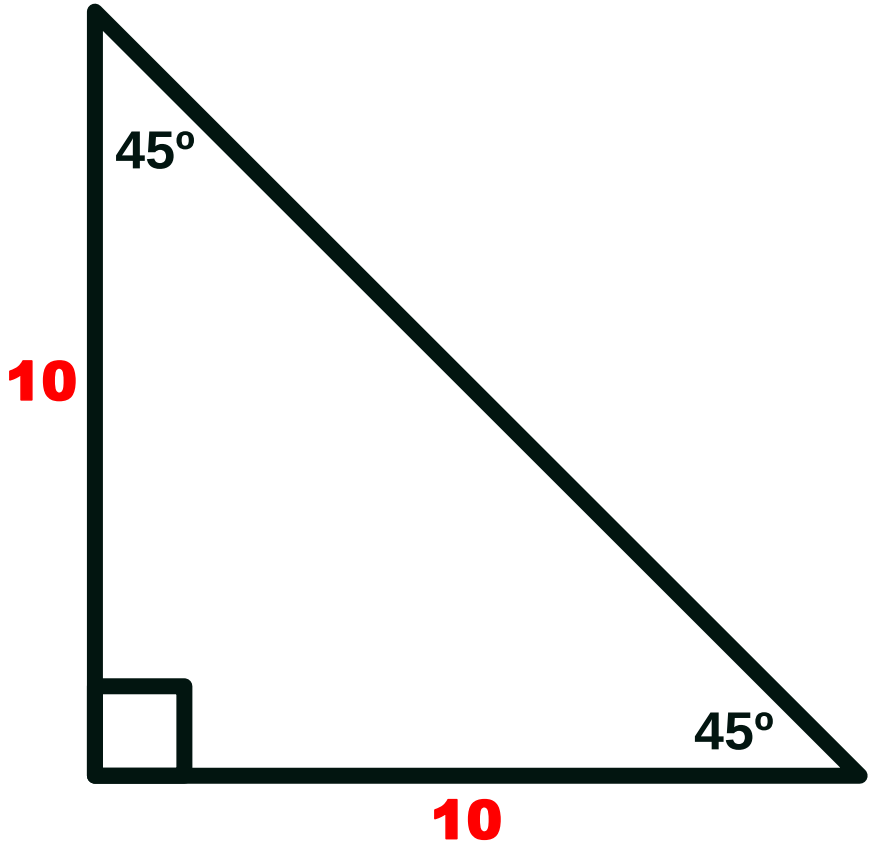
An Isosceles Right Triangle

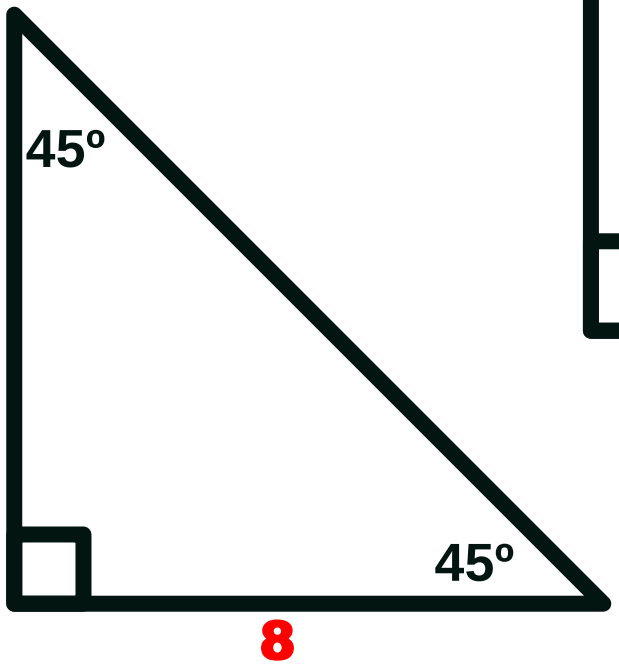


45-45-90 Triangle

An Isosceles Right Triangle

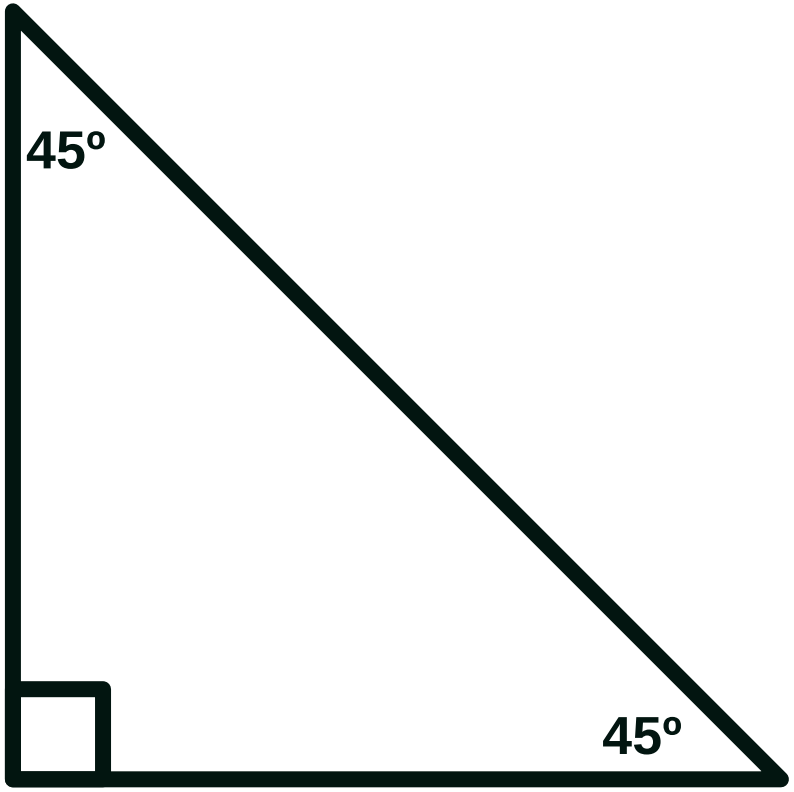




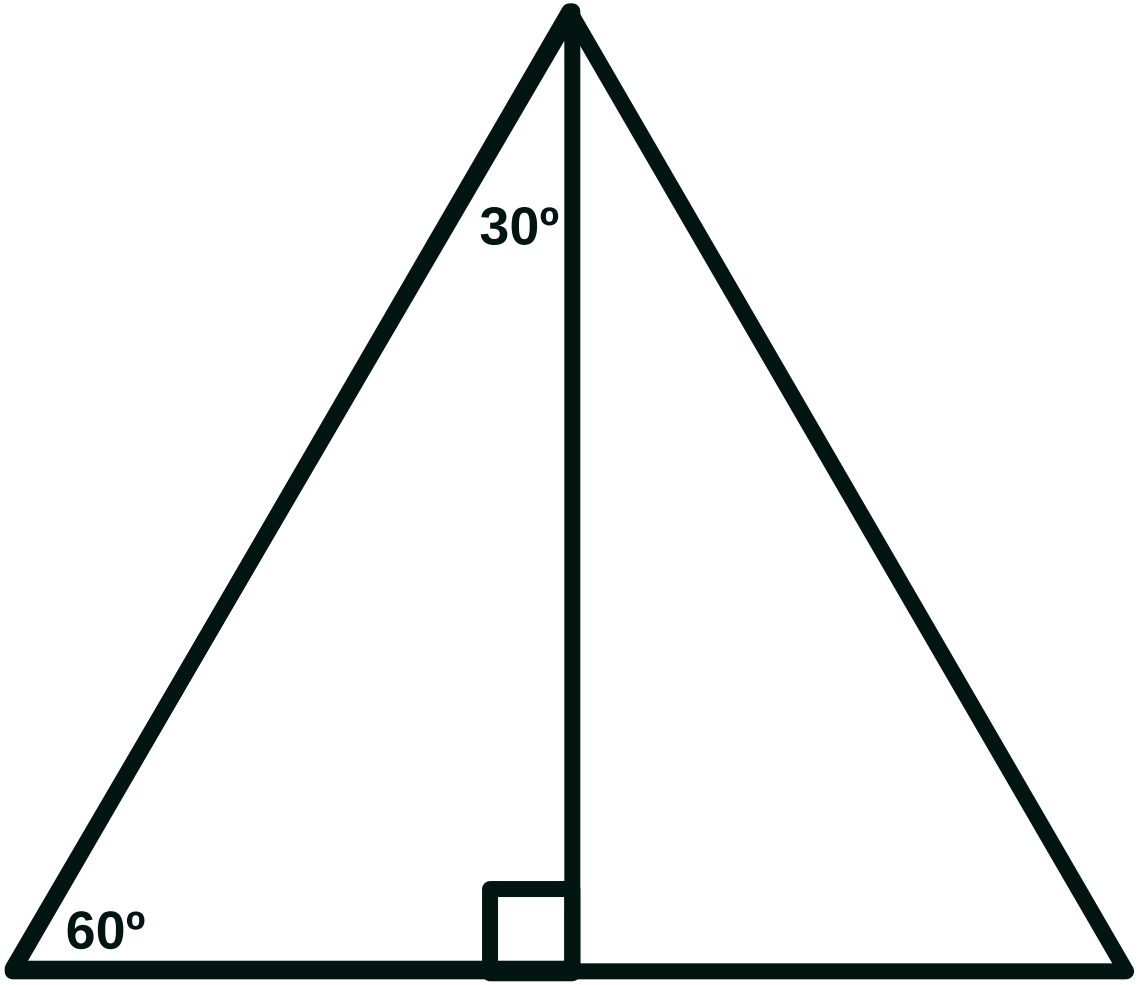


45-45-90 Triangle

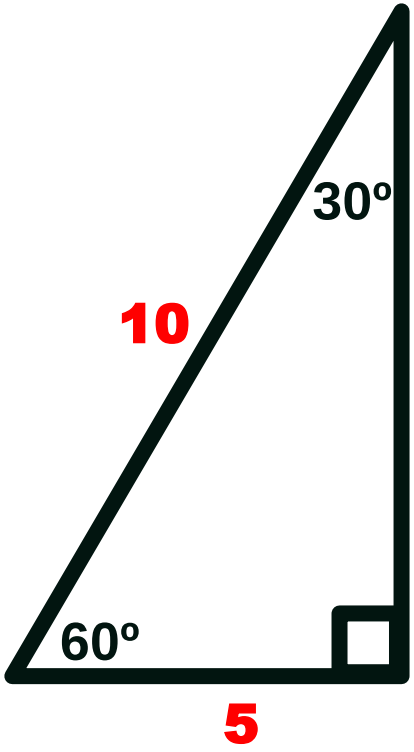
An Isosceles Right Triangle

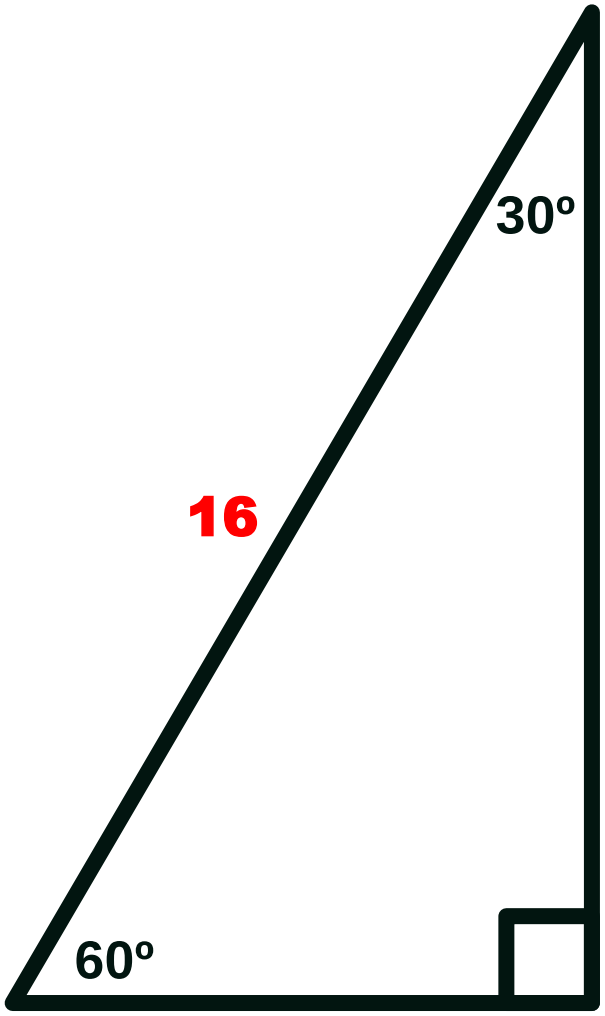


30-60-90 Triangle

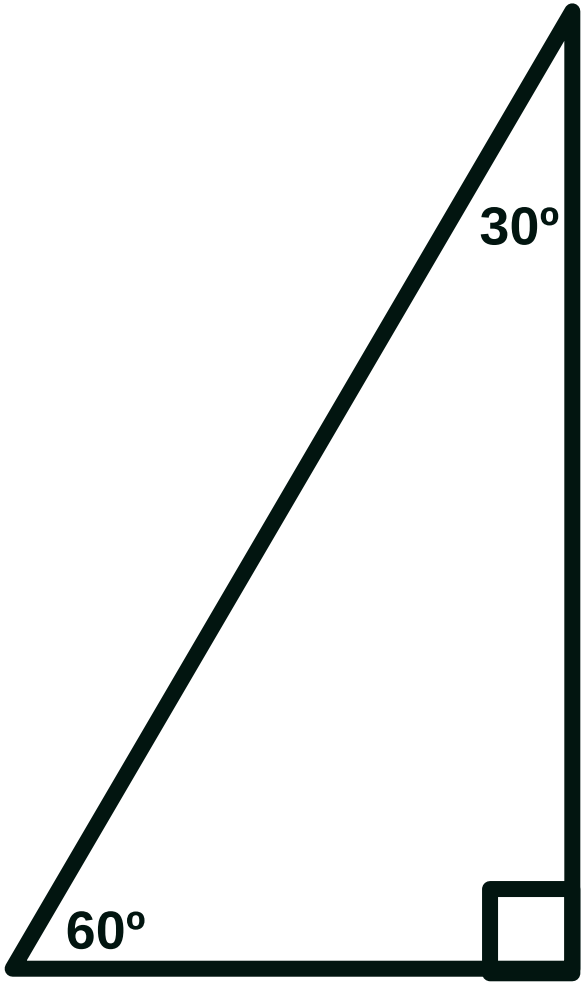


30-60-90 Triangle





30-60-90 Triangle



Special Right Triangles—45-45-90

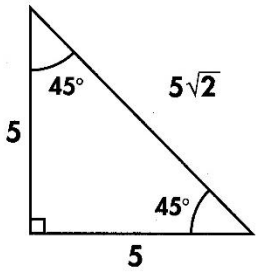
Any right triangle contains a 90° angle. The remaining two angles must add up to 90°. When the two angles are each 45°, we have a special triangle called a 45-45-90 triangle.

The properties of a 45-45-90 triangle are as follows:

1) both legs are equal in length;

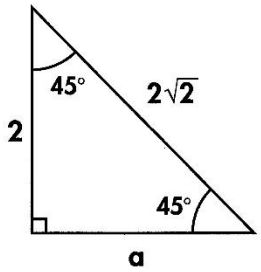
2) the hypotenuse is $\sqrt{2}$ times the length of a leg.

Look at the example below.

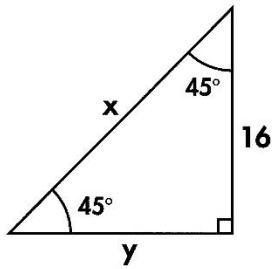


Find the missing lengths of the 45-45-90 triangles below.

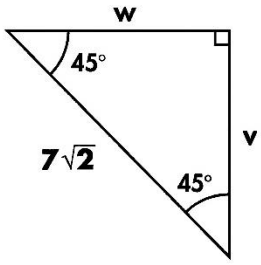
1.



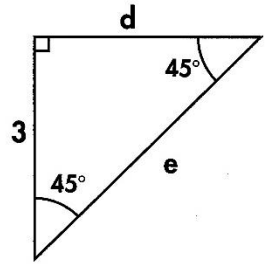
2.



3.



4.



Special Right Triangles—30-60-90

Any right triangle contains a 90° angle. The remaining two angles must add up to 90°. When the other two angles are 30° and 60°, we have a special right triangle called a 30-60-90 triangle.

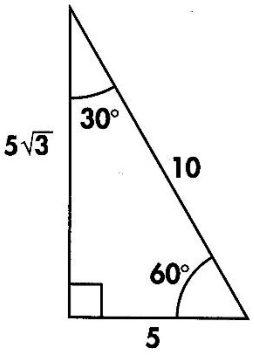
Here are the important properties of a 30-60-90 triangle:

1) the hypotenuse is twice as long as the leg opposite the 30° angle;

2) the side opposite the 30° angle is half the length of the hypotenuse;

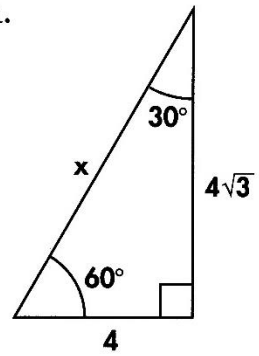
3) the side opposite the 60° angle is $\sqrt{3}$ times the length of the shorter leg.

You can see these properties in the triangle below.

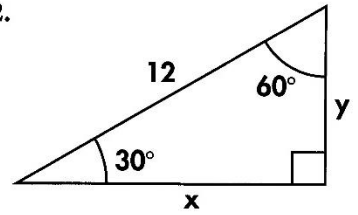


Find the missing sides in the 30-60-90 triangles below.

1.



2.



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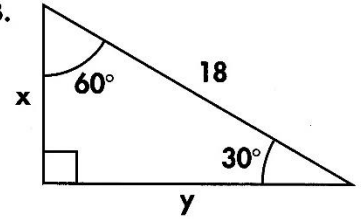


More Practice With 30-60-90 Triangles

Review the special properties of 30-60-90 triangles below.

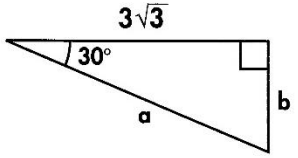
1) The hypotenuse is twice as long as the leg opposite the 30° angle.

2) The side opposite the 30° angle is half the length of the hypotenuse.

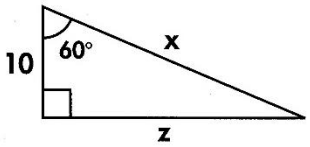
3) The side opposite the 60° angle is $\sqrt{3}$ times the length of the shorter leg.

Find the missing lengths of the 30-60-90 triangles below.

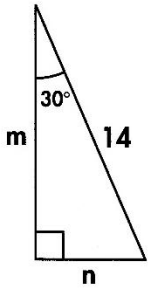
1.



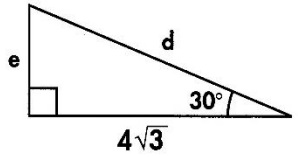
2.



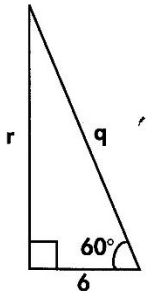
3.



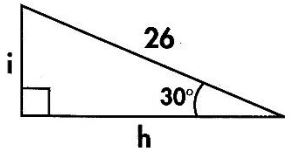
4.



5.



6.



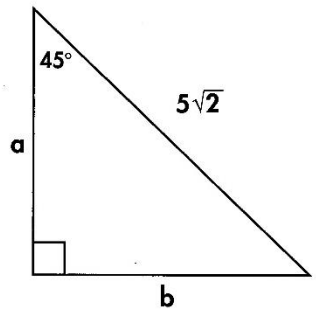
Practice With 45-45-90 Triangles

Use the special properties you have learned about 45-45-90 triangles to find the missing lengths of the triangles below. Here are the properties as a reminder:

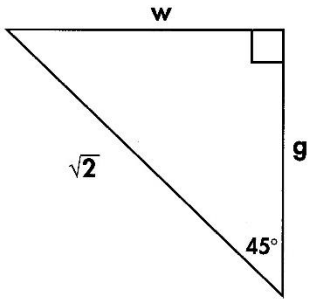
1) both legs are equal in length;

2) the hypotenuse is $\sqrt{2}$ times the length of a leg.

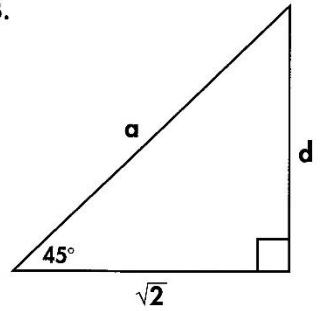
1.



2.



3.



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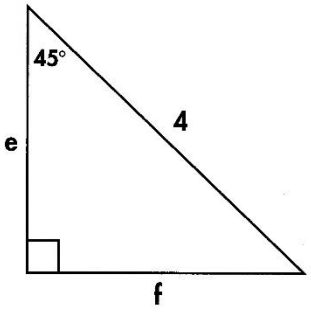
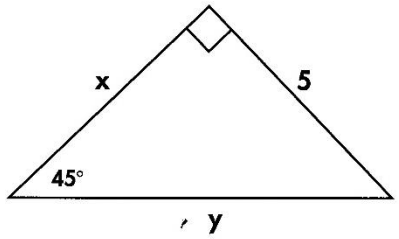


5.



6.