NAME _____

Date _____ Period_____

SYLLABUS

GEOMETRY H

Unit 6 Syllabus: Right Triangles

Day	Topic
1	The Pythagorean Theorem and Its Converse
2	8.2 – Special Right Triangles
3	Applications of Special Right Triangles
4	Quest

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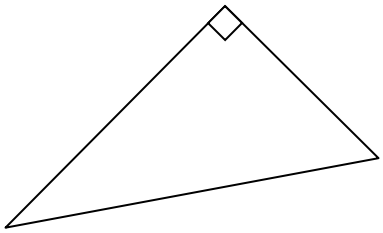
Unit 6, Day 1: The Pythagorean Theorem (S. 8-1, p. 417)

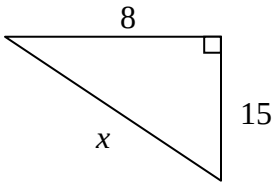
1. The **Pythagorean Theorem** can be used to find the sides of a _____ triangle.
   a. The first person to use it for a _____ triangle fails for the quarter!

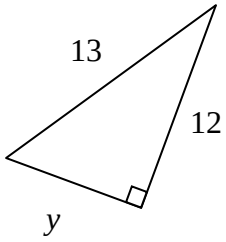


If it's a right triangle, then

c **MUST** be the _____ of the triangle!!!

2. Practice: Find the missing sides, *x* and *y*, in the triangles below.





Note: on your homework, answers will not always be integers. Review sq. roots if needed!

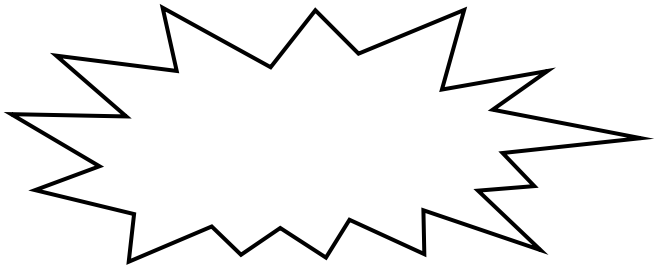
3. Conclusion from the chart…
   When you are given three side lengths of a triangle, you can determine if the triangle is right, obtuse, or acute: Here's how…

i) $c^2 = a^2 + b^2$ ⇒ _____

ii) $c^2 > a^2 + b^2$ ⇒ _____

iii) $c^2 < a^2 + b^2$ ⇒ _____

(this is the converse of Pythagorean Thm)



4. A Pythagorean triple is a set of whole numbers (not zero) such that:

$$c^2 = a^2 + b^2$$

5. A common Pythagorean triple is 3, 4, 5. Prove that it is in fact a Pythagorean triple…

6. Any multiple of a Pythagorean triple, is also a Pythagorean triple…
   a) In other words: 6, 8, 10 (multiplied by 2), 9, 12, 15 (multiplied by 3), and so on, are all Pythagorean triples.
   b) If the GCF of the numbers is 1, then the triple is said to be _____.
   c) For an extensive list of primitive Pythagorean triples, visit the website…

7. Practice: Determine if the following sides create a triangle that is right, acute, or obtuse.
   a) 10, 12, 15

   b) 10, 24, 26

   c) 3, 6, 8

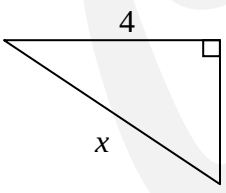
   d) 7, 8, 19

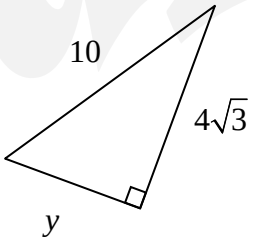
   e) 9, 9, 9

8. What is the significance of *c* when using Pythagorean theorem?

9. How can you determine if a triangle is acute, right, or obtuse when given 3 sides?

10. Find the missing sides below…





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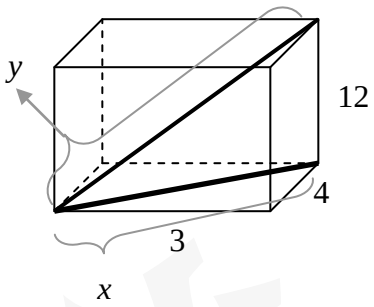
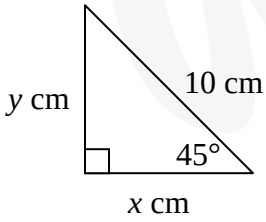
Unit 6, Day 2: Special Right Triangles (S 8-2, p. 425)

1. Solve for x and y in the figure below. Note: Figure not drawn to scale.



2. Solve for x and y in the figure below.

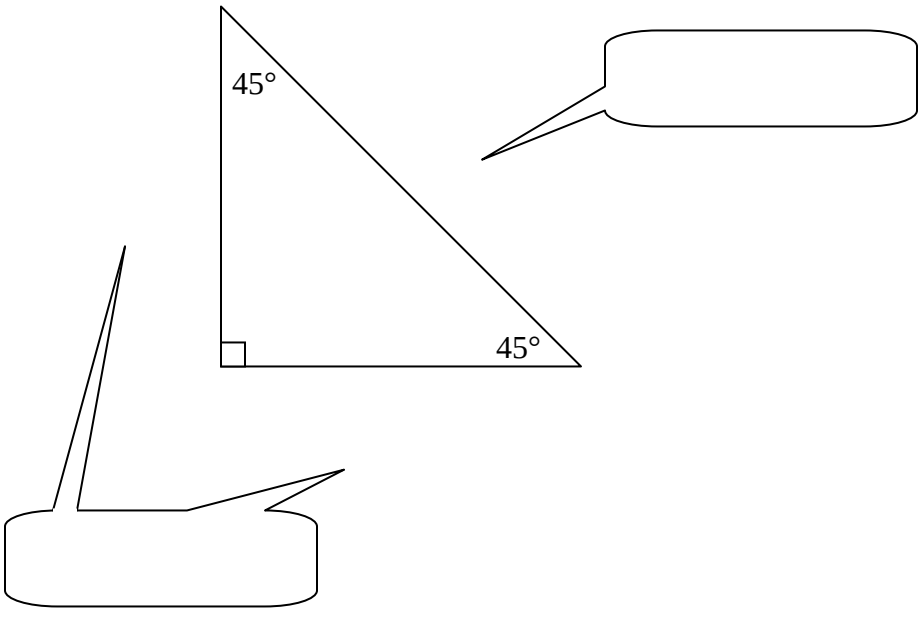


3. There are two types of special right triangles.

   a. _____ triangle.

   a) Two 45-45-90 triangles are always sometimes never **congruent**

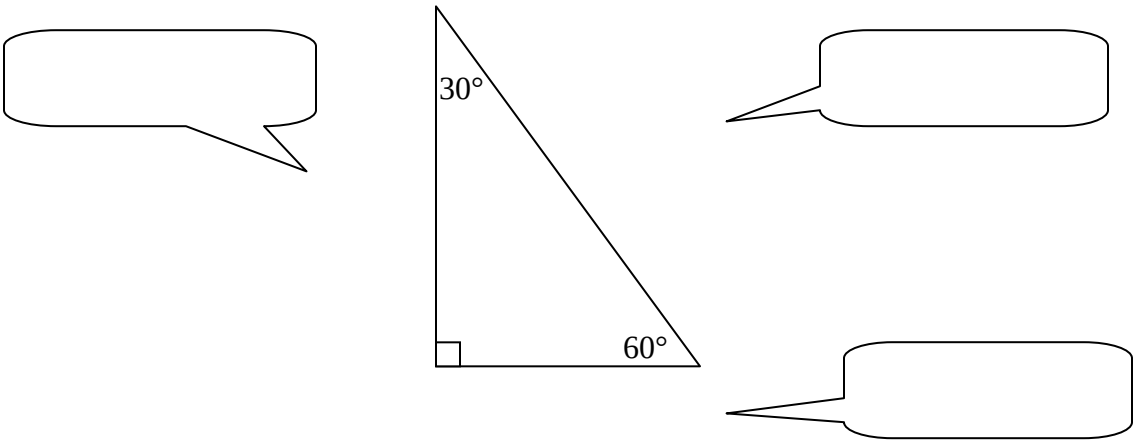
   b) Two 45-45-90 triangles are always sometimes never **similar**.



b. _____ triangle.

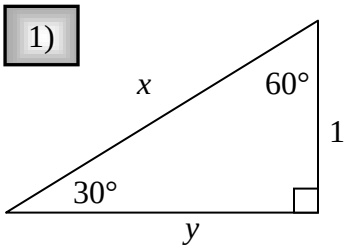
a) Two 30-60-90 triangles are always sometimes never **congruent**

b) Two 30-60-90 triangles are always sometimes never **similar**.



4. Find the value of each variable. Leave your answers in simplest radical form.

1)



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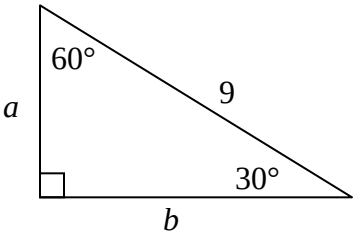

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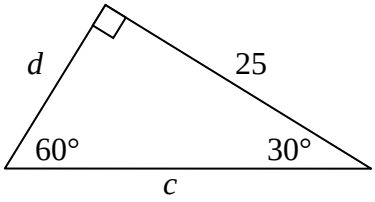
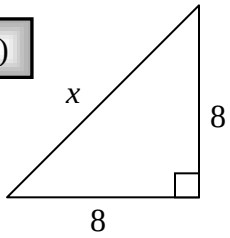
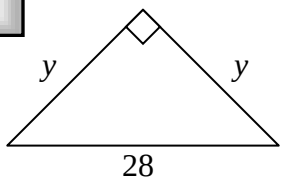


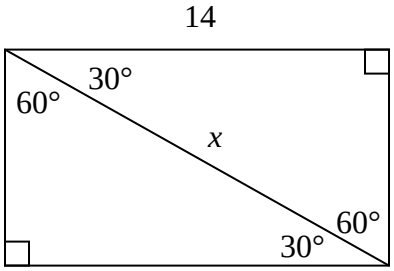
4)



5)



6)



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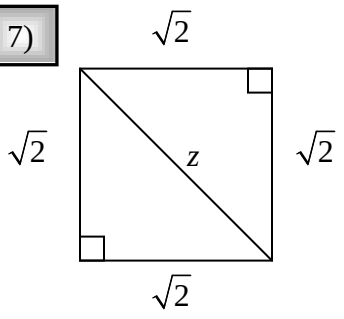

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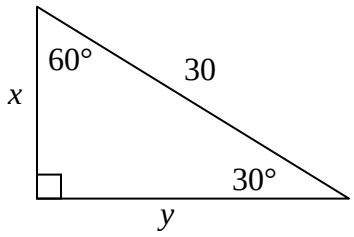

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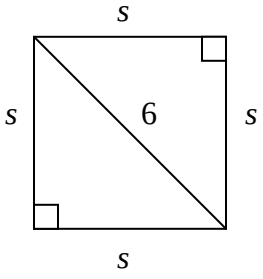

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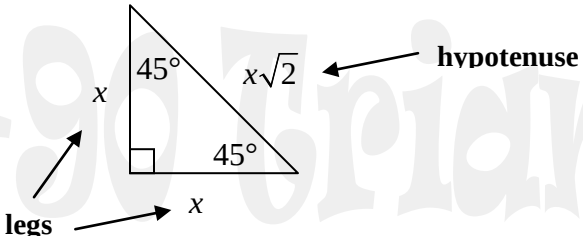
STUDY GUIDE
GEOMETRY H

How do I find Missing Sides of Special Right Triangles?!

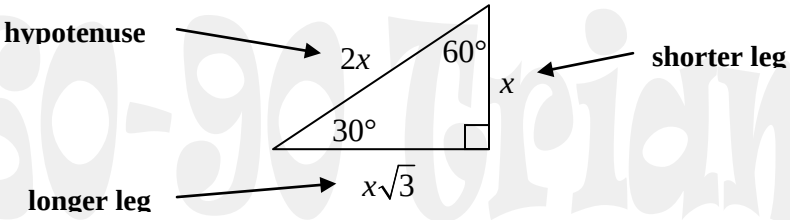
45-45-90 Triangles



I know one of the legs → multiply by $\sqrt{2}$ → to find the hypotenuse.

I know the hypotenuse → divide by $\sqrt{2}$ → to find one of the legs.

30-60-90 Triangles



I know the shorter leg → multiply by 2 → to find the hypotenuse.

I know the shorter leg → multiply by $\sqrt{3}$ → to find the longer leg.

I know the hypotenuse → divide by 2 → to find the shorter leg.

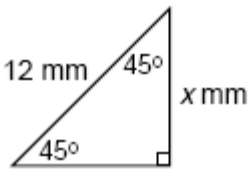
*Once you know the shorter leg, use the diagram above to find the other piece

I know the longer leg → divide by $\sqrt{3}$ → to find the shorter leg.

You could also set up proportions, it's up to you…

Find the value of x.

1.



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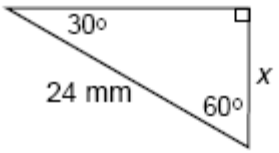
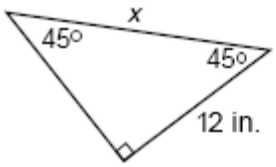
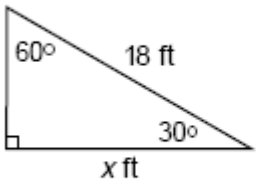


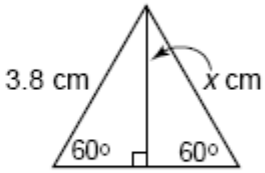
3.



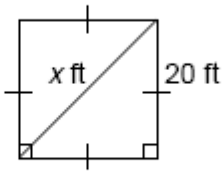
4.



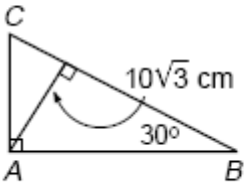
5.



6.



Closure: Find the perimeter of the triangle shown at the right.



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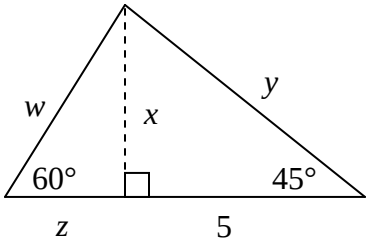
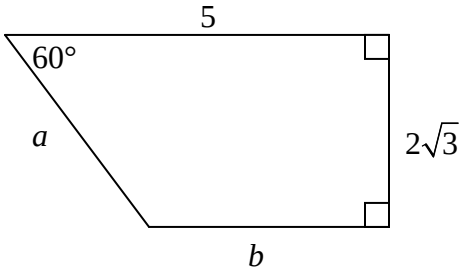
NOTES

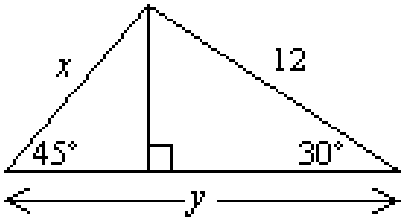
GEOMETRY H

Unit 6, Day 3: Applications of Special Right Triangles

11. Find the value of each variable. Leave answers in simplest radical form.



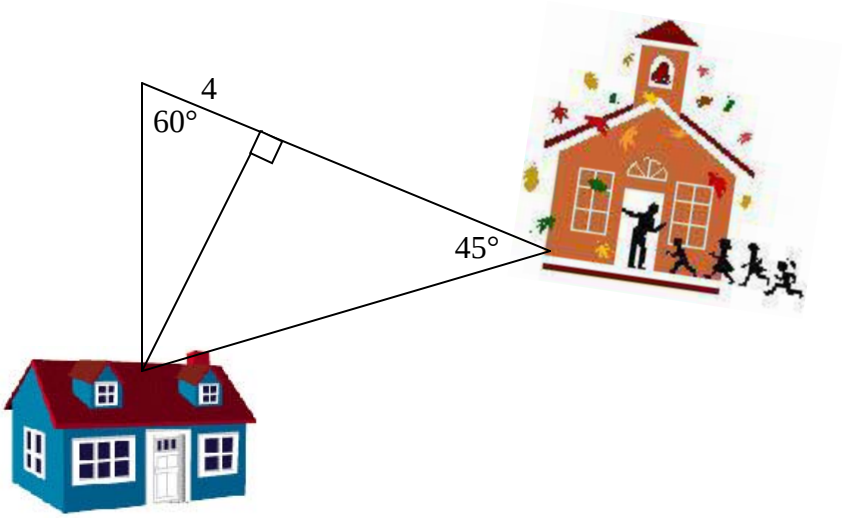




12. Each side of a rhombus is 14 in. long. Two of the sides form a 60° angle. Find the area of the rhombus, and round to the nearest square inch.

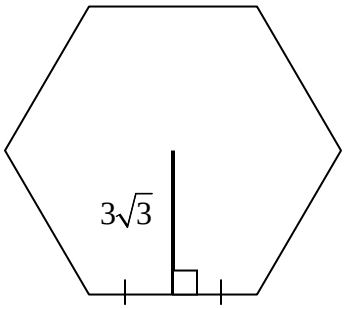
13. A square has a perimeter of $48\sqrt{5}$. What is the length of the diagonal of the square?

14. Use the figure below to find the distance from the house to the school.



15. A regular hexagon has an apothem of $3\sqrt{3}$. Find the area of the hexagon.

Note: The apothem is the segment from the center of the polygon to a side.
The apothem is a perpendicular bisector to the side of the polygon.



<u>Closure</u>:

a) When do you use the Pythagorean Theorem?

b) When do you use special right triangles?

c) Two side lengths of a triangle are 8 and 7. What is a possible length of the third side if the triangle must acute?

d) One question I have is…