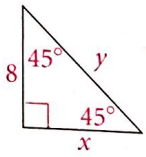
Practice and Problem Solving

A Practice by Example

Find the value of each variable. If your answer is not an integer, leave it in simplest radical form.

Example 1 (page 366)

1.



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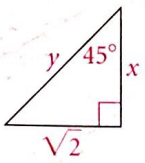

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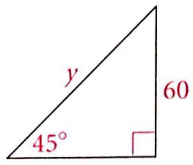
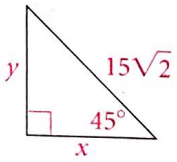


Examples 2, 3 (page 367)

4.



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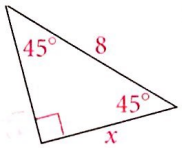

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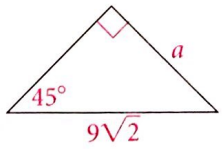

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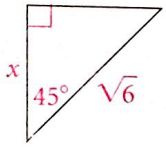

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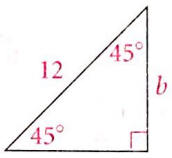

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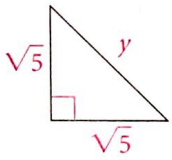
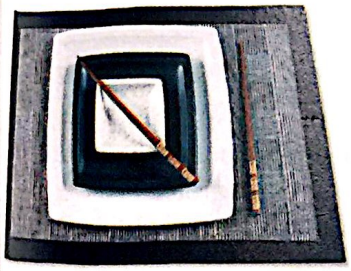




Exercise 10

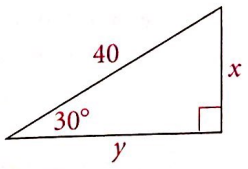
10. Dinnerware Design You are designing dinnerware. What is the length of a side of the smallest square plate on which a 20-cm chopstick can fit along a diagonal without any overhang? Round your answer to the nearest tenth of a centimeter.

11. Helicopters The four blades of a helicopter meet at right angles and are all the same length. The distance between the tips of two adjacent blades is 36 ft. How long is each blade? Round your answer to the nearest tenth.

Example 4 (page 368)

x^2 Algebra Find the value of each variable. If your answer is not an integer, leave it in simplest radical form.

12.



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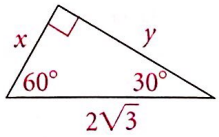

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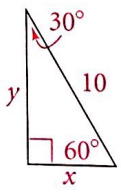
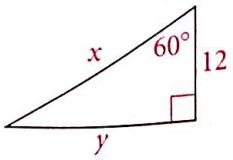


Example 5 (page 368)

Algebra Find the value of each variable. Leave your answer in simplest radical form.

15.



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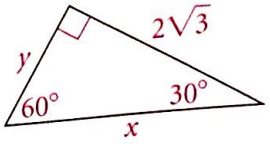

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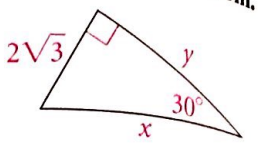

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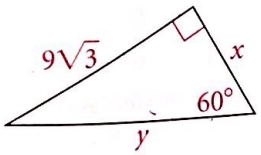

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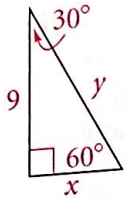

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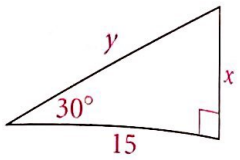


Example 6 (page 368)

Find the area of each figure. Round your answer to the nearest tenth.

21. an equilateral triangle with sides 10 cm

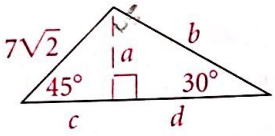
22. a rhombus with a 60° angle and sides 5 cm long

23. a rhombus with a 45° angle and sides 12 m long

B Apply Your Skills

Algebra Find the value of each variable. Leave your answer in simplest radical form.

24.



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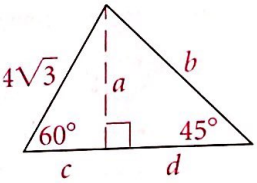

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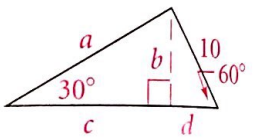

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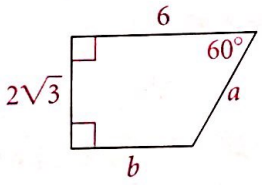

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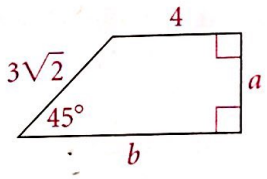

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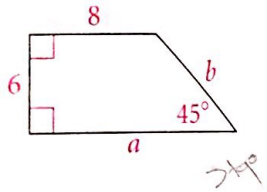
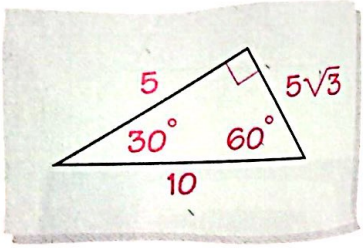
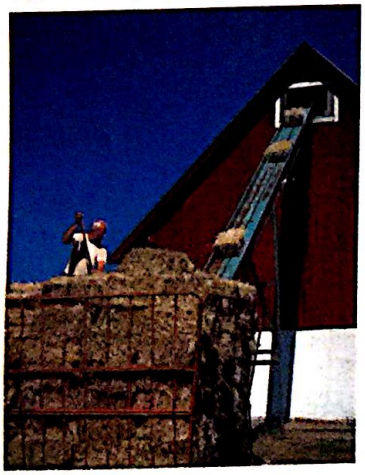


30. Error Analysis Sandra drew the triangle at the right. Rika said that the lengths couldn't be correct. With which student do you agree? Explain your answer.



31. Open-Ended Write a real-life problem that you can solve using a 30°-60°-90° triangle with a 12 ft hypotenuse. Show your solution.



Exercise 32

32. Farming A conveyor belt carries bales of hay from the ground to the barn loft 24 ft above the ground. The belt makes a 60° angle with the ground.

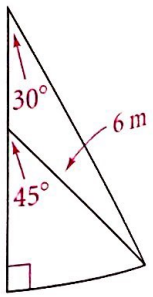
a. How far does a bale of hay travel from one end of the conveyor belt to the other? Round your answer to the nearest foot.

b. The conveyor belt moves at 100 ft/min. How long does it take for a bale of hay to go from the ground to the barn loft?

33. House Repair After heavy winds damaged a farmhouse, workers placed a 6-m brace against its side at a 45° angle. Then, at the same spot on the ground, they placed a second, longer brace to make a 30° angle with the side of the house.

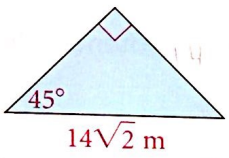
a. How long is the longer brace? Round your answer to the nearest tenth of a meter.

b. How much higher on the house does the longer brace reach than the shorter brace?



Find the area of each figure. When an answer is not a whole number, round to the nearest tenth.

34.



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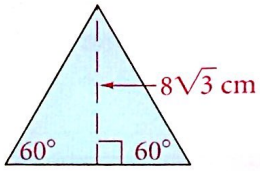

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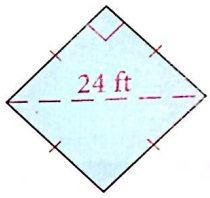

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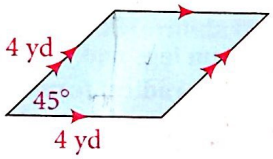

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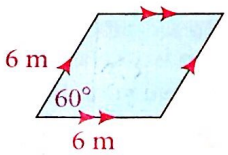

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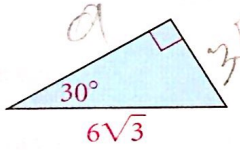
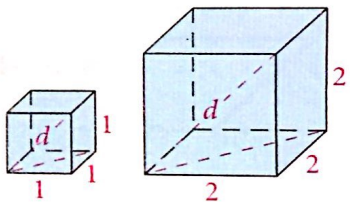


Challenge

40. Geometry in 3 Dimensions Find the length d, in simplest radical form, of the diagonal of a cube with sides of the given length.

a. 1 unit **b.** 2 units **c.** s units



41. a. Find the area of an equilateral triangle with altitude 1 unit. Leave your answer in simplest radical form.

b. Use the relationships among the lengths of the sides in a 30°-60°-90° triangle to find a formula for the area of an equilateral triangle in terms of the length h of an altitude.

c. Use your formula from part (b) to find the area of an equilateral triangle with altitude of length 6 units.

Standardized Test Prep