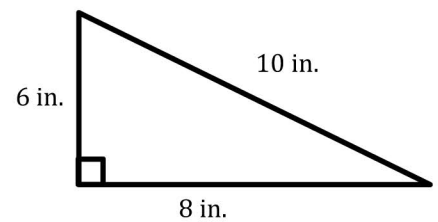


Name _____

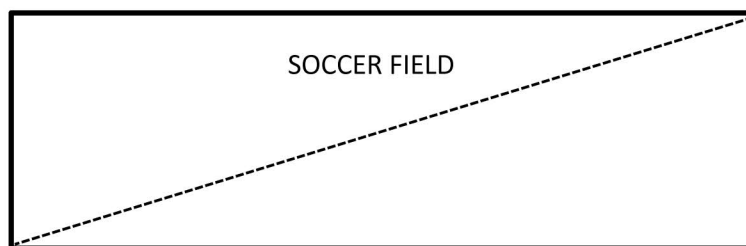
Date _____

The Area of Right Triangles

1. Calculate the area of the right triangle. Each figure is not drawn to scale.

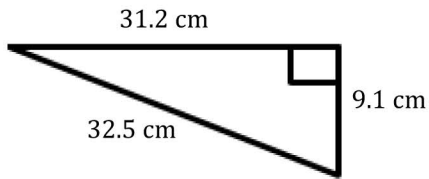


2. Dan and Joe are responsible for cutting the grass on the local high school soccer field. Joe cuts a diagonal line through the field, as shown in the diagram below, and says that each person is responsible for cutting the grass on one side of the line. Dan says that this is not fair because he will have to cut more grass than Joe. Is Dan correct? Why or why not?

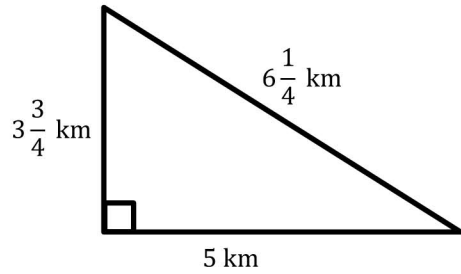


Calculate the area of each right triangle below. Note that the figures are not drawn to scale.

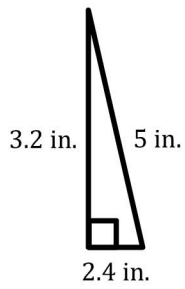
1.



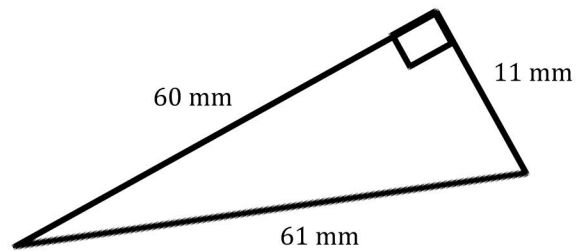
2.



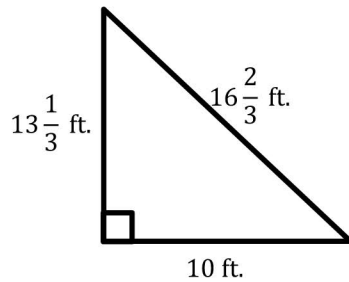
3.



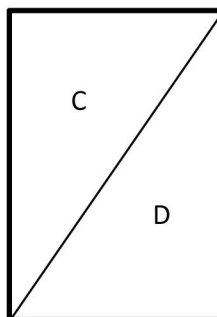
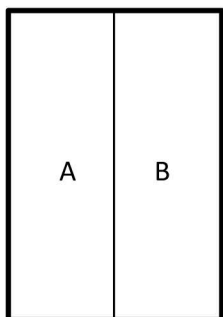
4.



5.



6. Elania has two congruent rugs at her house. She cut one vertically down the middle, and she cut diagonally through the other one.

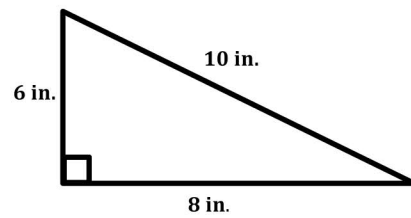


After making the cuts, which rug (labeled A, B, C, or D) has the larger area? Explain.

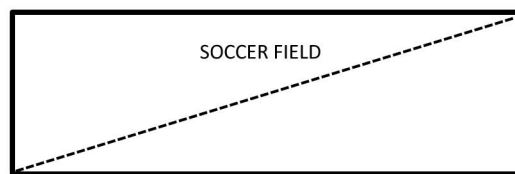
7. Give the dimensions of a right triangle and a parallelogram with the same area. Explain how you know.
8. If the area of a right triangle is $\frac{9}{16}$ sq. ft. and the height is $\frac{3}{4}$ ft., write an equation that relates the area to the base, b , and the height. Solve the equation to determine the base.

1. Calculate the area of the right triangle. Each figure is not drawn to scale.

$$A = \frac{1}{2}bh = \frac{1}{2}(8 \text{ in.})(6 \text{ in.}) = 24 \text{ in}^2$$



2. Dan and Joe are responsible for cutting the grass on the local high school soccer field. Joe cuts a diagonal line through the field and says that each person is responsible for cutting the grass on one side of the line. Dan says that this is not fair because he will have to cut more grass than Joe. Is Dan correct? Why or why not?

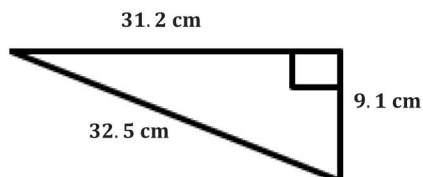


Dan is not correct. The diagonal line Joe cut in the grass would split the field into two right triangles. The area of each triangle is exactly half the area of the entire field because the area formula for a right triangle is

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

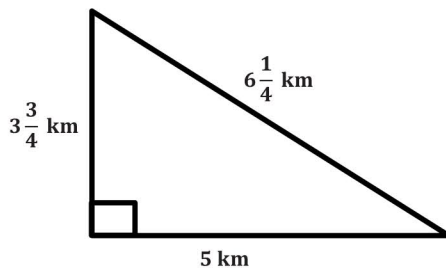
Calculate the area of each right triangle below. Note that the figures are not drawn to scale.

- 1.



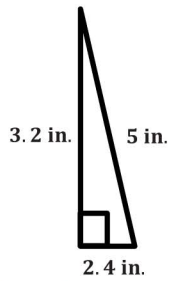
$$A = \frac{1}{2}bh = \frac{1}{2}(31.2 \text{ cm})(9.1 \text{ cm}) = 141.96 \text{ cm}^2$$

- 2.



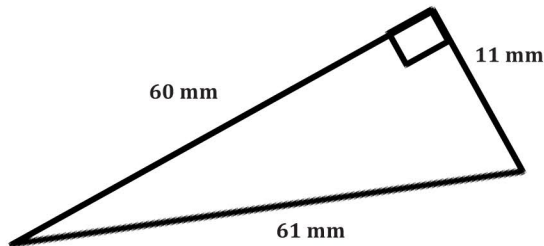
$$A = \frac{1}{2}bh = \frac{1}{2}(5 \text{ km})\left(3\frac{3}{4} \text{ km}\right) = \frac{1}{2}\left(\frac{5}{1} \text{ km}\right)\left(\frac{15}{4} \text{ km}\right) = \frac{75}{8} \text{ km}^2 = 9\frac{3}{8} \text{ km}^2$$

3.



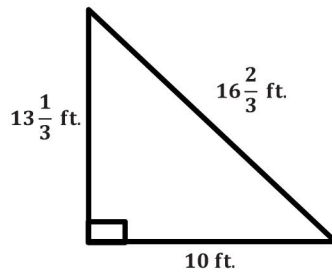
$$A = \frac{1}{2}bh = \frac{1}{2}(2.4 \text{ in.})(3.2 \text{ in.}) = 3.84 \text{ in}^2$$

4.



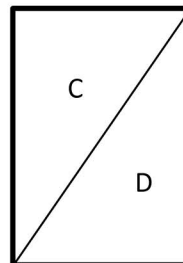
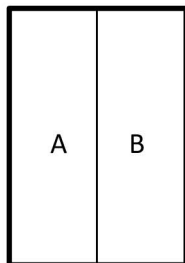
$$A = \frac{1}{2}bh = \frac{1}{2}(11 \text{ mm})(60 \text{ mm}) = 330 \text{ mm}^2$$

5.



$$A = \frac{1}{2}bh = \frac{1}{2}\left(13\frac{1}{3} \text{ ft.}\right)(10 \text{ ft.}) = \frac{1}{2}\left(\frac{40}{3} \text{ ft.}\right)\left(\frac{10}{1} \text{ ft.}\right) = \frac{400}{6} \text{ ft}^2 = 66\frac{2}{3} \text{ ft}^2$$

6. Elania has two congruent rugs at her house. She cut one vertically down the middle, and she cut diagonally through the other one.



After making the cuts, which rug (labeled A, B, C, or D) has the larger area? Explain.

All of the rugs are the same size after making the cuts. The vertical line goes down the center of the rectangle, making two congruent parts. The diagonal line also splits the rectangle in two congruent parts because the area of a right triangle is exactly half the area of the rectangle.

7. Give the dimensions of a right triangle and a parallelogram with the same area. Explain how you know.

Answers will vary.

8. If the area of a right triangle is $\frac{9}{16}$ sq. ft. and the height is $\frac{3}{4}$ ft., write an equation that relates the area to the base, b , and the height. Solve the equation to determine the base.

$$\frac{9}{16} \text{ ft}^2 = \frac{1}{2} b \left(\frac{3}{4} \text{ ft.} \right)$$

$$\frac{9}{16} \text{ ft}^2 = \left(\frac{3}{8} \text{ ft.} \right) b$$

$$\frac{9}{16} \text{ ft}^2 \div \frac{3}{8} \text{ ft.} = \left(\frac{3}{8} \text{ ft.} \right) b \div \frac{3}{8} \text{ ft.}$$

$$\frac{3}{2} \text{ ft.} = b$$

$$1\frac{1}{2} \text{ ft.} = b$$

Therefore, the base of the right triangle is $1\frac{1}{2}$ ft.