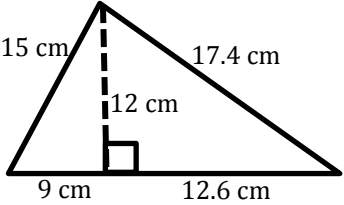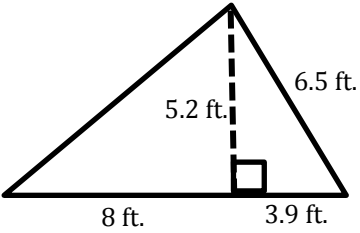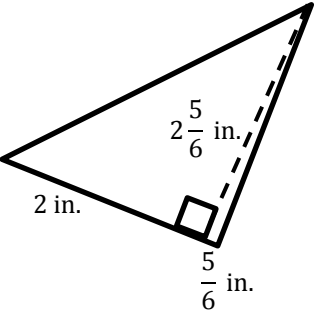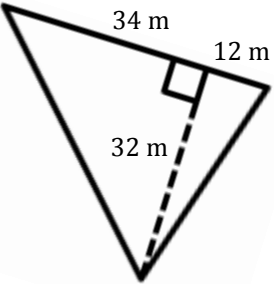# Lesson 3: The Area of Acute Triangles Using Height and Base

Classwork

Exercises

1. Work with a partner on the exercises below. Determine if the area formula $A = \frac{1}{2}bh$ is always correct. You may use a calculator, but be sure to record your work on your paper as well. Figures are not drawn to scale.

	Area of Two Right Triangles	Area of Entire Triangle
15 cm, 17.4 cm, 12 cm, 9 cm, 12.6 cm		
5.2 ft., 6.5 ft., 8 ft., 3.9 ft.		
$2\frac{5}{6}$ in., 2 in., $\frac{5}{6}$ in.		
34 m, 12 m, 32 m		

2. Can we use the formula $A = \frac{1}{2} \times$ base $\times$ height to calculate the area of triangles that are not right triangles? Explain your thinking.

3. Examine the given triangle and expression.

   $\frac{1}{2}$ (11 ft.)(4 ft.)

   3 ft.   8 ft.
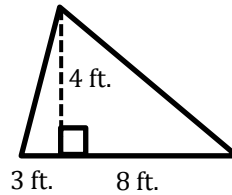
   Explain what each part of the expression represents according to the triangle.

4. Joe found the area of a triangle by writing $A = \frac{1}{2}(11 \text{ in.})(4 \text{ in.})$, while Kaitlyn found the area by writing $A = \frac{1}{2}(3 \text{ in.})(4 \text{ in.}) + \frac{1}{2}(8 \text{ in.})(4 \text{ in.})$. Explain how each student approached the problem.

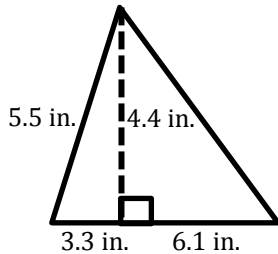5. The triangle below has an area of 4.76 sq. in. If the base is 3.4 in., let h be the height in inches.
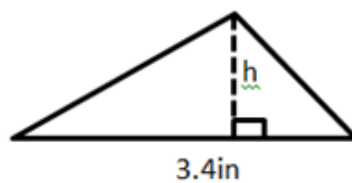
   3.4in

   a. Explain how the equation $4.76 \text{ in}^2 = \frac{1}{2}(3.4 \text{ in.})h$ represents the situation.

   b. Solve the equation.

COMMON CORE

Lesson 3:   The Area of Acute Triangles Using Height and Base
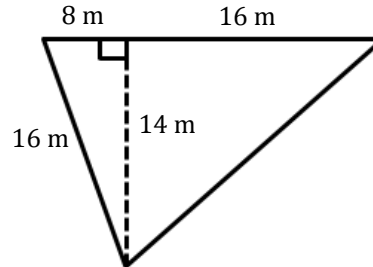Date: 2/5/15

engage^ny

Problem Set

Calculate the area of each shape below. Figures are not drawn to scale.

1.

5.5 in.   4.4 in.

3.3 in.   6.1 in.

2.

8 m   16 m

16 m   14 m

3.

12 ft.

13 ft.   13 ft.

12 ft.

5 ft.   12 ft.   5 ft.

4.

35km

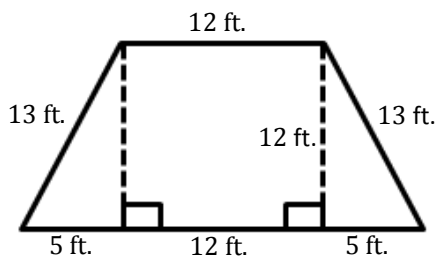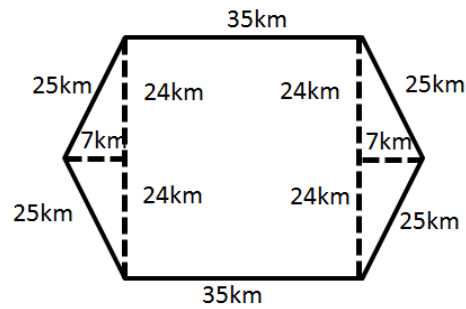25km   24km   24km   25km

7km   7km

24km   24km

25km   25km

35km

4.   Immanuel is building a fence to make an enclosed play area for his dog. The enclosed area will be in the shape of a triangle with a base of 48 in. and an altitude of 32 in. How much space does the dog have to play?

5.   Chauncey is building a storage bench for his son's playroom. The storage bench will fit into the corner and against two walls to form a triangle. Chauncey wants to buy a cover for the bench.
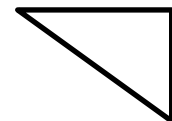
   If the storage bench is $2\frac{1}{2}$ ft. along one wall and $4\frac{1}{4}$ ft. along the other wall, how big will the cover have to be in order to cover the entire bench?

6.   Examine the triangle to the right.

   a.   Write an expression to show how you would calculate the area.

   b.   Identify each part of your expression as it relates to the triangle.

5 in.

4 in.

7 in.   3 in.
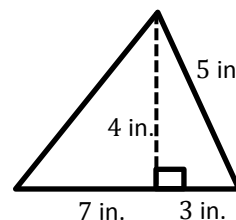
7.   A triangular room has an area of $32\frac{1}{2}$ sq. m. If the height is $7\frac{1}{2}$ m, write an equation to determine the length of the base, b, in meters. Then solve the equation.