Name _____ **Ms. Abadie's** _____ **Period**

Chapter 7	Constructions and Scale
MAFS.7.G.2.5	Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.
Essential Question	What can you conclude about the angles formed by two intersecting lines? *In this lesson I am learning geometric definitions so I can use them to help me solve for a variable.*
7.1 Adjacent and Vertical Angles	

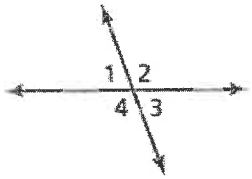
Classification of Angles

Acute:	***Right:***	***Obtuse:***	***Straight:***
Less than 90°	Equal to 90°	Greater than 90° and less than 180°	Equal to 180°

Adjacent Angles

Words Two angles are **adjacent angles** when they share a common side and have the same vertex.

Examples



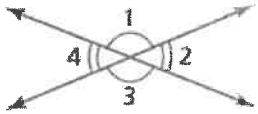
∠1 and ∠2 are adjacent.

∠2 and ∠4 are not adjacent.

Vertical Angles

Words Two angles are **vertical angles** when they are opposite angles formed by the intersection of two lines. Vertical angles are **congruent angles**, meaning they have the same measure.

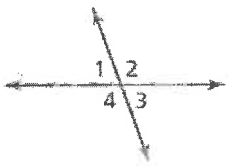
Examples



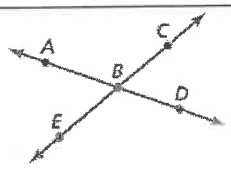
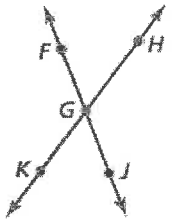
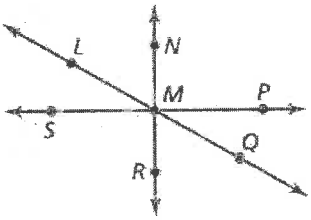
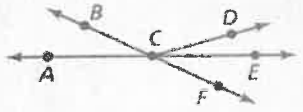
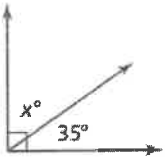
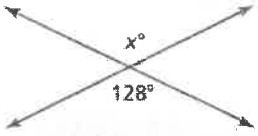
∠1 and ∠3 are vertical angles.

∠2 and ∠4 are vertical angles.

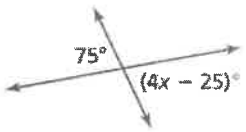
1. **VOCABULARY** When two lines intersect, how many pairs of vertical angles are formed? How many pairs of adjacent angles are formed?



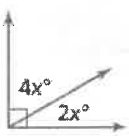
2. **REASONING** Identify the congruent angles in the figure. Explain your reasoning.

	Use the figure at the right. **3.** Measure each angle formed by the intersecting lines. **4.** Name two angles that are adjacent to $\angle ABC$. 
Homework **7.1 Practice A** **#1-2**	**Name two pairs of adjacent angles and two pairs of vertical angles in the figure.** **5.**  **6.** 
	7. ERROR ANALYSIS Describe and correct the error in naming a pair of vertical angles. ✗  $\angle ACB$ and $\angle BCD$ are vertical angles.
Homework **7.1 Practice A** **#3-6**	**Tell whether the angles are *adjacent* or *vertical*. Then find the value of x.** **8.**  **9.**  **10.** 

11.



12.



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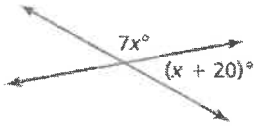
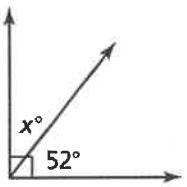


Tell whether the angles are *adjacent* or *vertical*. Then find the value of *x*.

14.



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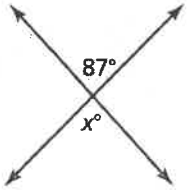
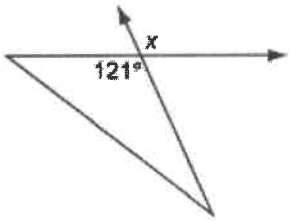


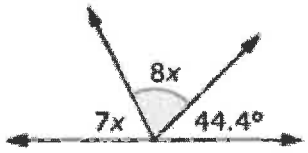
16. Angle 1 and angle 2 are supplementary. Angle 2 is vertical to a 75° angle. What are the measures of angle 1 and angle 2?

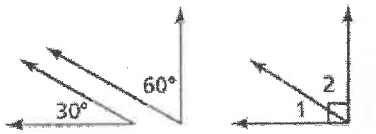
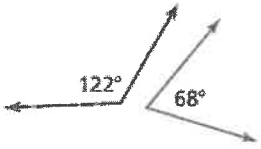
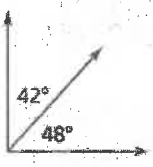
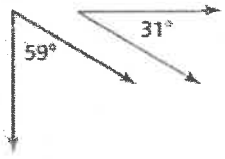
A figure is shown.

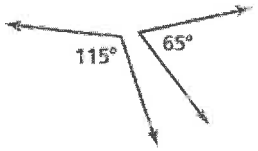
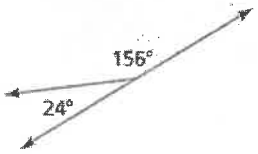
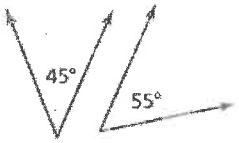
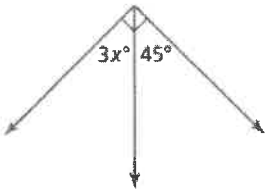
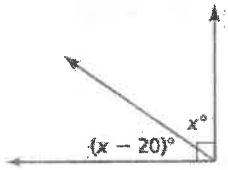
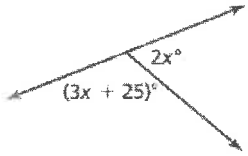
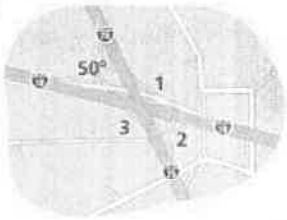
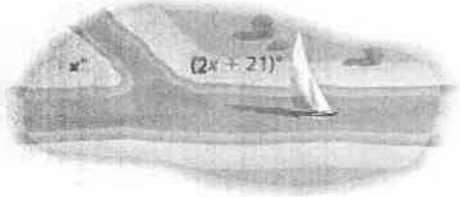


What is the measure, in degrees, of angle x?

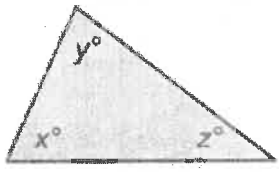
What is the measure, in degrees, of the highlighted (middle) angle?

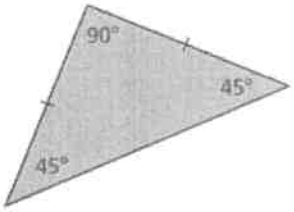
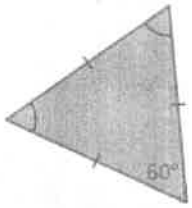
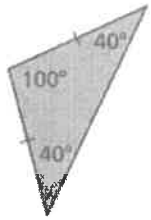
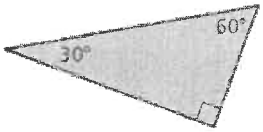
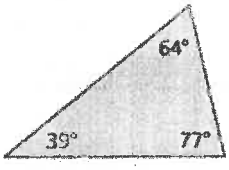
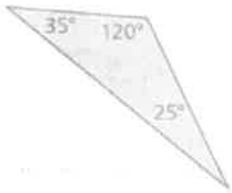
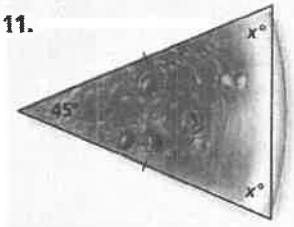


MAFS.7.G.2.5	Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.
Essential Question	How can you classify two angles as commplementary or supplementary? *In this lesson I am learning how to classify angles as complemenatry or supplementary so I can use that to help me solve for missing x values.*
7.2 Complementary and Supplementary	**Complementary Angles** **Words** Two angles are **complementary angles** when the sum of their measures is 90°. **Examples**  ∠1 and ∠2 are complementary angles. **Supplementary Angles** **Words** Two angles are **supplementary angles** when the sum of their measures is 180°. **Examples**  ∠3 and ∠4 are supplementary angles.
	1. **VOCABULARY** Explain how complementary angles and supplementary angles are different. 2. **REASONING** Can adjacent angles be supplementary? complementary? neither? Explain.
Homework 7.2 Practice A #1-2	**Tell whether the statement is *always*, *sometimes*, or *never* true. Explain.** 3. If x and y are supplementary angles, then x is obtuse. 4. If x and y are right angles, then x and y are supplementary angles. 5. If x and y are complementary angles, then y is a right angle.
Homework 7.2 Practice A #3-6	**Tell whether the angles are *complementary*, *supplementary*, or *neither*.** 6.  7.  8. 

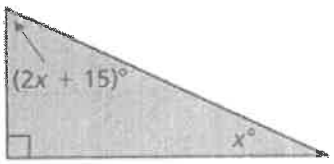
	9.  **10.**  **11.** 
Homework 7.2 Practice A #8-9	**Tell whether the angles are *complementary* or *supplementary*. Then find the value of x.** **12.**  **13.**  **14.** 
	15. INTERSECTION What are the measures of the other three angles formed by the intersection?  **16. TRIBUTARY** A tributary joins a river at an angle. Find the value of x. 

MAFS.7.G.1.2	Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or

	sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.
Essential Question	How can you use side lengths and angle measures to classify triangles? *In this lesson I will learn how to classify triangles so I can name triangles, construct triangles, and solve for missing angle measues wihin a triangle.*
7.3 Triangles	**Classifying Triangles Using Angles** *acute* triangle — all acute angles *obtuse* triangle — 1 obtuse angle *right* triangle — 1 right angle *equiangular* triangle — 3 congruent angles **Classifying Triangles Using Sides** **Congruent sides** have the same length. *scalene* triangle — no congruent sides *isosceles* triangle — at least 2 congruent sides *equilateral* triangle — 3 congruent sides
7.3 ext. Angle Measures of Triangles	**Sum of the Angle Measures of a Triangle** **Words** The sum of the angle measures of a triangle is 180°. **Algebra** $x + y + z = 180$ 
	1. **WRITING** How can you classify triangles using angles? using sides? 2. **DIFFERENT WORDS, SAME QUESTION** Which is different? Find "both" answers. Construct an equilateral triangle. Construct a triangle with 3 congruent sides. Construct an equiangular triangle. Construct a triangle with no congruent sides.
	Construct a triangle with the given description. **3.** side lengths: 4 cm, 6 cm **4.** side lengths: 5 cm, 12 cm **5.** angles: 65°, 55°

Homework **7.3 Practice A** **#1-4**	**Classify the triangle.** **6.**  **7.**  **8.**  **9.**  **10.**  **11.** 
Homework **7.3 ext. Practice** **#1-6**	**Find the value of x. Then classify the triangle.** **11.**  **12.**  **13.** 

14.



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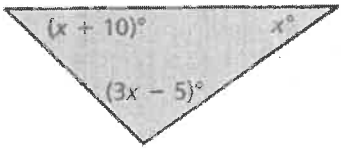
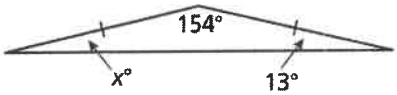


Find the value of *x*. Then classify the triangle.

16.



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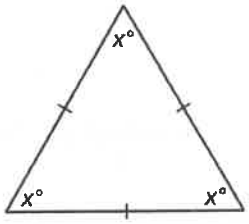


Draw a triangle with the given angle measures. Then classify the triangle.

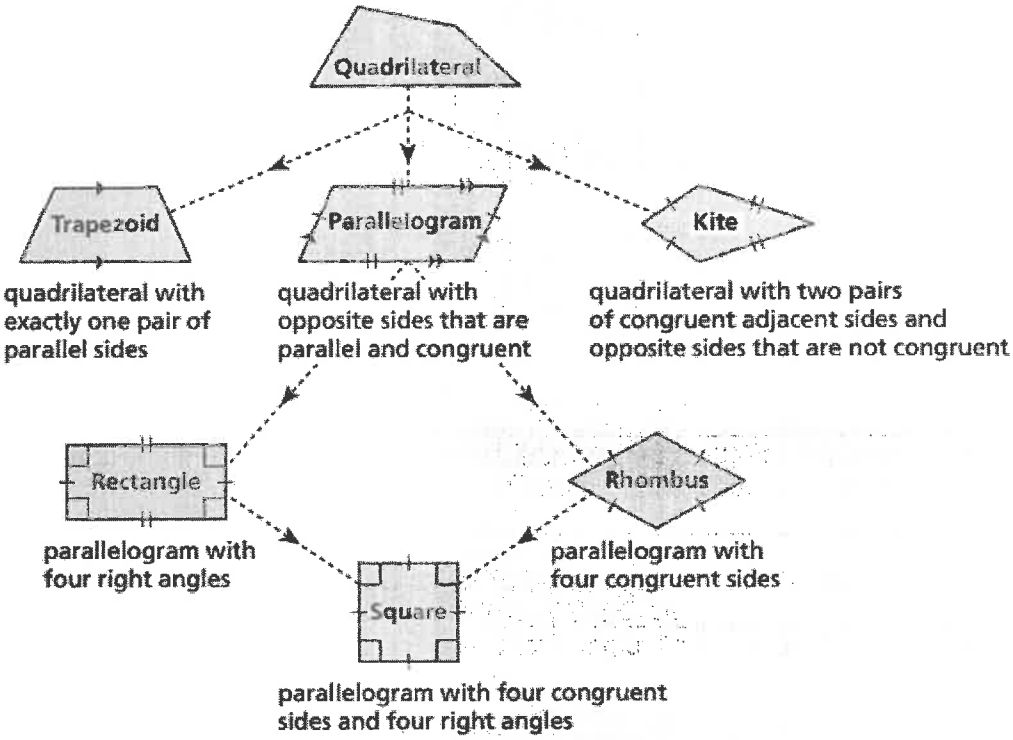
18. 30°, 60°, 90°

19. 55°, 55°, 70°

Nathan wants to draw a triangle. He knows that two of the side lengths are 5 inches and 7 inches.

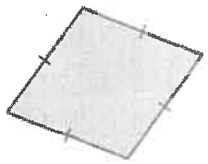
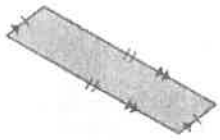
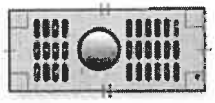
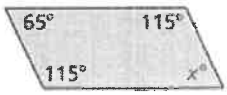
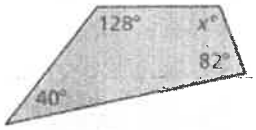
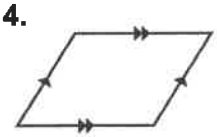
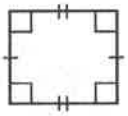
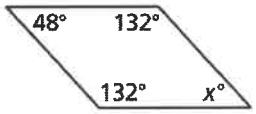
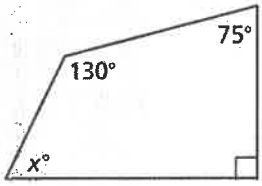
What is a possible length for the third side?

MAFS.7.G.2.6	Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.
Essential Question	How can you classify quadrilaterals? *In this lesson I will learn how to classify quadrilaterals so I can identify quadrilaterals, identify their lines of symmetry, and compare them.*
7.4 Quadrilaterals	Quadrilateral- a figure with four sides and four angles that add up to 360 degees.



1. **VOCABULARY** Which statements are true?
   - **a.** All squares are rectangles.
   - **b.** All squares are parallelograms.
   - **c.** All rectangles are parallelograms.
   - **d.** All squares are rhombuses.
   - **e.** All rhombuses are parallelograms.
2. **REASONING** Name two types of quadrilaterals with four right angles.
3. **WHICH ONE DOESN'T BELONG?** Which type of quadrilateral does *not* belong with the other three? Explain your reasoning.

rectangle parallelogram square kite

Homework 7.4 Practice A #1-4	**Classify the quadrilateral.** **4.**  **5.**  **6.**  **7.**  **8.**  **9.** 
Homework 7.4 Practice A #5-6	**Find the value of *x*.** **10.**  **11.**  **12.** 
	13. Which two quadrilaterals have 4 congruent sides?
	Classify the quadrilateral. **14.**  **15.** 
	Find the value of *x*. **16.**  **17.** 
	18. Draw a parallelogram with a 70° angle and a 110° angle.

MAFS.7.G.1.1	Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.
Essential Question	How can you enlarge or reduce a drawing poportionally? *In this lesson I will learn about scale drawings so I can use a ratio (model over actual) to find missing dimensions.*
7.5 Scale Drawings	A **scale drawing** is a proportional, two-dimensional drawing of an object. A **scale model** is a proportional, three-dimensional model of an object. **Scale** The measurements in scale drawings and models are proportional to the measurements of the actual object. The **scale** gives the ratio that compares the measurements of the drawing or model with the actual measurements. $\frac{1 \text{ in.}}{10 \text{ mi}}$ ← drawing distance / actual distance 1 in. : 10 mi (drawing : actual) A scale can be written without units when the units are he same. A scale without units is called a scale factor.
	1. **VOCABULARY** Compare and contrast the terms *scale* and *scale factor.* 2. **CRITICAL THINKING** The scale of a drawing is 2 cm : 1 mm. Is the scale drawing *larger* or *smaller* than the actual object? Explain. 3. **REASONING** How would you find the scale factor of a drawing that shows a length of 4 inches when the actual object is 8 feet long?
Homework **7.5 Practice A** **#2-5**	**Find the missing dimension. Use the scale factor 1 : 12.**

	Item	Model	Actual
12.	Mattress	Length: 6.25 in.	Length: _____ in.
13.	Corvette	Length: _____ in.	Length: 15 ft
14.	Water tower	Depth: 32 cm	Depth: _____ m
15.	Wingspan	Width: 5.4 ft	Width: _____ yd
16.	Football helmet	Diameter: _____ mm	Diameter: 21 cm

Find the missing dimension. Use the scale factor 1 : 8.

17. Model length: 6 cm

Actual length: ?

18. Model height: ?

Actual height: 28 in.

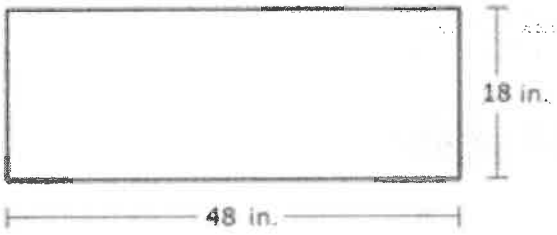
19. A scale drawing of an American flag is 10 inches long and 6 inches tall. The actual flag is 3 feet tall.

a. What is the scale of the drawing?

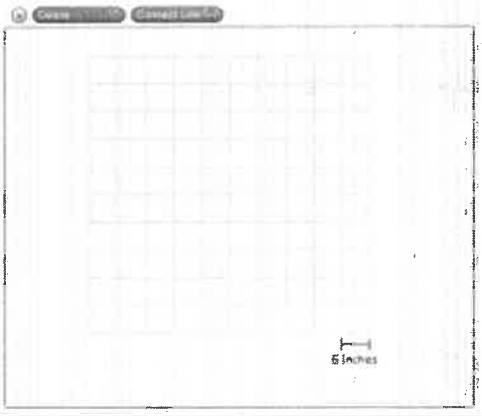
b. Find the perimeter and area of the American flag in the scale drawing.

c. Find the actual perimeter and area of the American flag.

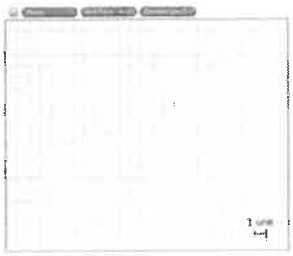
A rectangle with its dimensions, in inches (in), is shown.



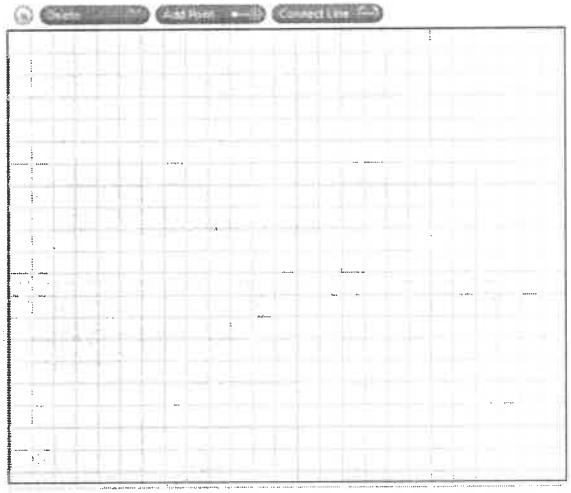
Use the Connect Line tool to create a scale drawing of the rectangle.



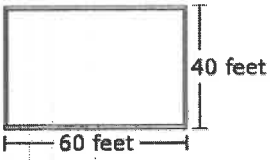
Use the Connect Line tool to draw a figure that has at least one pair of parallel sides and two side lengths of 5 units and 7 units.



Use the Connect Line tool to draw a quadrilateral that has exactly two lines of symmetry.



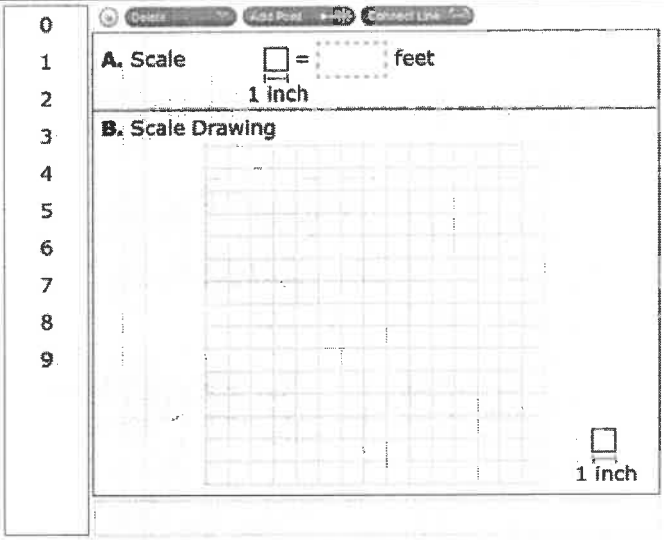
Eric wants to create a scale drawing of a house.



The scale drawing needs to fit on a piece of paper that is 6 inches wide. The drawing itself must be at least 3 inches wide.

A. Drag numbers into the box to show an appropriate scale for the drawing.

B. Use the Connect Line tool to create a drawing based on the scale you chose in Part A.



Lisa drew a picture of a boat. She used the scale shown.

1 inch : 6 feet

The boat in her picture is 7 inches long.

What is the length, in feet, of the actual boat?