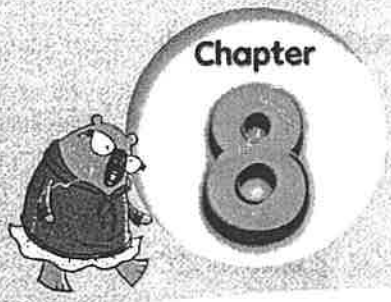
Name: _____ Date: _____

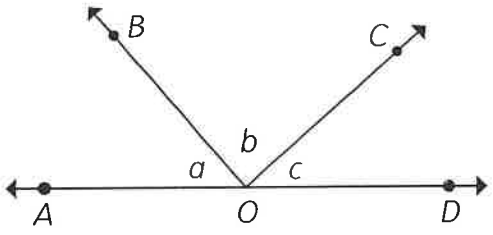


Fact Fluency
Polygons

8a Measuring Angles on a Line

Example

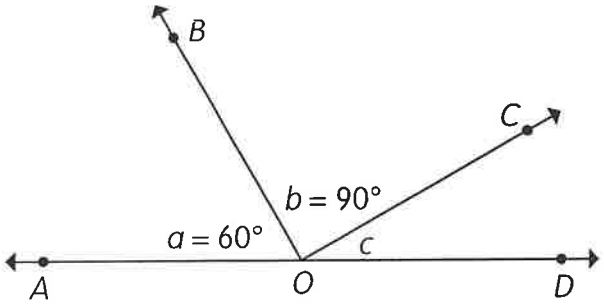
We can find measures of angles on a straight line.



$\overleftrightarrow{AD}$ is a straight line.

$m\angle a + m\angle b + m\angle c = 180°$

The sum of the angles on a straight line is 180°.



$\overleftrightarrow{AD}$ is a straight line.

1. What is the measure of $\angle c$? _____°

2. How did you find the measure of $\angle c$?

_____

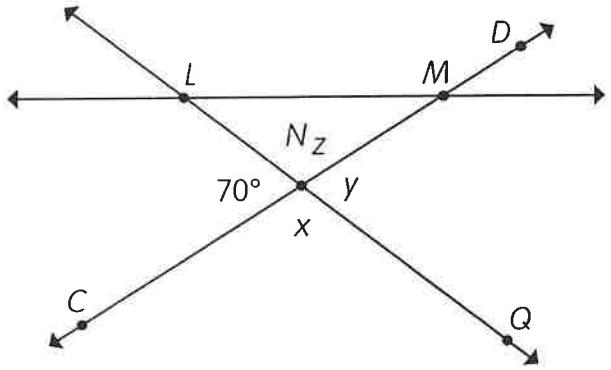
3. If you split $\angle a$ into two equal angles, what would be the measure of each angle? How do you know?

_____

4. What is another possible combination of the measures of $\angle a$, $\angle b$, and $\angle c$ to make a line?

$m\angle a =$ _____° $m\angle b =$ _____° $m\angle c =$ _____°

8b Measuring Angles on a Line



$\overleftrightarrow{CD}$ and $\overleftrightarrow{LQ}$ are straight lines. Complete the statements.

1. The measure of $\angle x$ is _____°

2. The measure of $\angle y$ is _____°

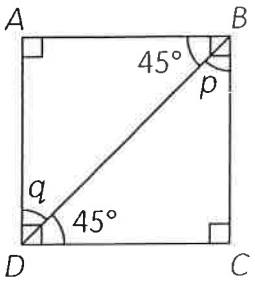
3. The measure of $\angle z$ is _____°

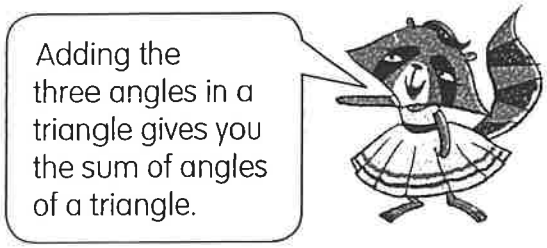
4. The sum of $70° + m\angle x + m\angle y + m\angle z$ is _____°

5. What do you notice about the measures of $\angle x$ and $\angle z$? Why is this the case?

_____

8c Measuring Angles in Triangles and Squares





Show your work to justify your answers.

1. What is the measure of $\angle p$? _____°

2. What is the measure of $\angle q$? _____°

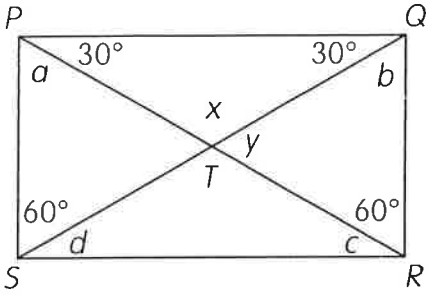
3. What is the total measure of all of the angles in triangle *ABD*? _____°

4. What is the total measure of all of the angles in triangle *BCD*? _____°

5. What is the total measure of all of the angles in square *ABCD*? _____°

8d Measuring Angles in Triangles and Squares

$PQRS$ is a rectangle. $\overleftrightarrow{PR}$ and $\overleftrightarrow{QS}$ are straight lines.



Complete the statements.

1. The measure of $\angle a$ is _____°.

2. The measure of $\angle b$ is _____°.

3. The measure of $\angle c$ is _____°.

4. The measure of $\angle d$ is _____°.

5. The measure of $\angle x$ is _____°.

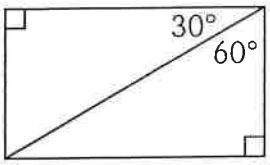
6. The measure of $\angle y$ is _____°.

7. What is the sum of the angle measures of triangle SPT? _____°

8e Measuring Angles in Quadrilaterals

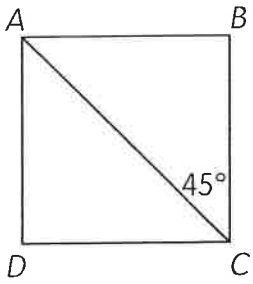
Example

You can find the sum of the angles of a quadrilateral by using triangles.



Knowing that the angles in a triangle add to 180°, you can fill in the missing angles.
Then, add up the angles to find the sum of angles in the quadrilateral.
(90° + 60° + 30°) + (90° + 60° + 30°) = 360°

1 *ABCD* is a square.



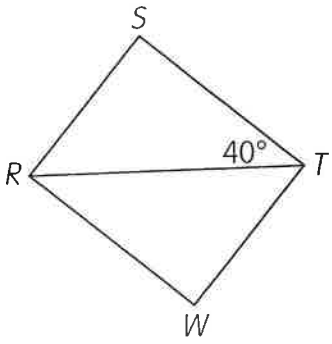
$m\angle ABC =$ _____ ° $m\angle ADC =$ _____ °

$m\angle ACD =$ _____ ° $m\angle BAC =$ _____ °

$m\angle DAC =$ _____ °

What is the sum of the angle measures in square *ABCD*? Show your work.

2 *RSTW* is a rectangle.



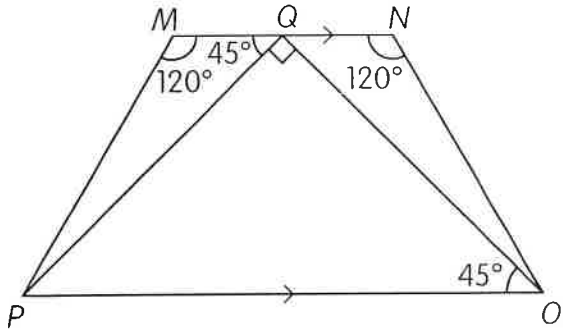
$m\angle RST =$ _____ ° $m\angle TWR =$ _____ °

$m\angle RTW =$ _____ ° $m\angle TRW =$ _____ °

$m\angle SRT =$ _____ °

3 What is the sum of the angle measures in rectangle *RSTW*? Show your work.

8f Measuring Angles in Quadrilaterals



1. Find the missing angle measures in quadrilateral *MNOP*. Show your work.

   $m\angle NOP =$ _____° $m\angle OPM =$ _____°

2. What is the sum of the angle measures in quadrilateral *MNOP*? Show your work.

3. In this and other activities, you found the sum of angle measures in different kinds of quadrilaterals. What conclusion can you make about the sum of angle measures in a quadrilateral?

   _____

   _____

4. Using an example of a different type of quadrilateral, show how your answer to 3 holds true. Draw a sketch and explain your thinking.

   _____

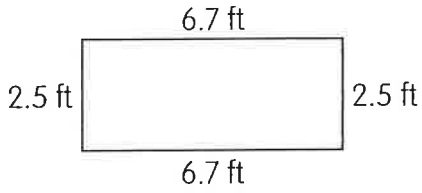
   _____

8g Perimeter of Quadrilaterals

The perimeter of a quadrilateral is the distance around the figure.
You can find the perimeter by finding the sum of the length of each side of the figure.

Find the perimeter of each quadrilateral.

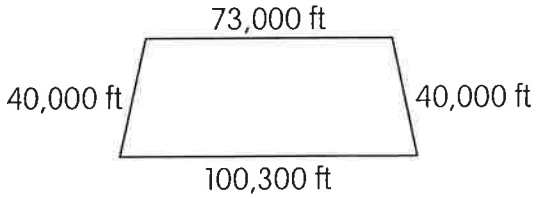
1.



Perimeter = _____ + _____ + _____ + _____

= _____ ft

2.

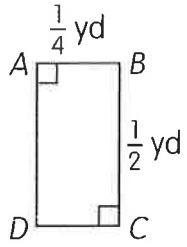


Perimeter = _____ ft

8h Perimeter of Quadrilaterals

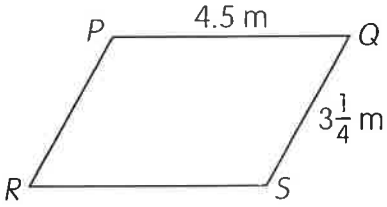
Find the perimeter of each quadrilateral.

1. *ABCD* is a rectangle.



Perimeter = _____ yd

2. *PQRS* is a parallelogram.

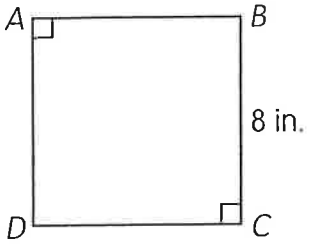


Perimeter = _____ m

8i Area of Quadrilaterals

The area of a quadrilateral is the amount of surface covered by the figure.
You can find the area of a rectangle by multiplying the length and the width.

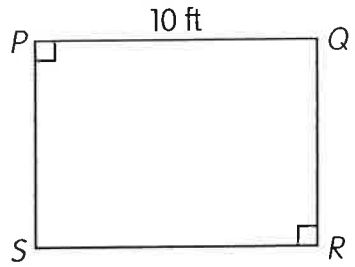
Find the missing measures.

1. 

Area of square $ABCD = 64$ in.^{2}

Length = 8 in.

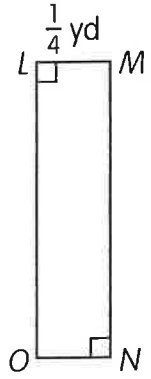
Width = _____ in.

2. 

Area of rectangle $PQRS = 70.2$ ft^2

Length = _____ ft

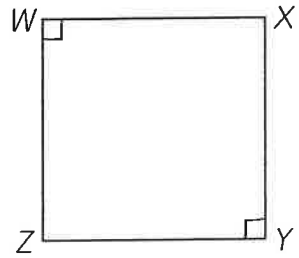
Width = _____ ft

3. 

Area of rectangle $LMNO = \frac{3}{4}$ yd^2

Length = _____ yd

Width = _____ yd

4. 

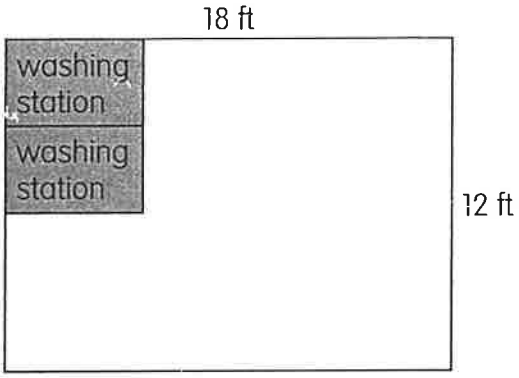
Area of square $WXYZ = 81$ in.^{2}

Length = _____ in.

Width = _____ in.

8j Real-World Area and Perimeter Problems

Catalina plans to open a dog grooming business. She needs as many washing stations that will fit in a 18 ft by 12 ft space. Each station must be at least 2 ft wide and cover 12 ft^2 of floor space.



1. What is the maximum number of washing stations that will fit in the rectangular space?

   Dimension of each station: _____ ft × _____ ft

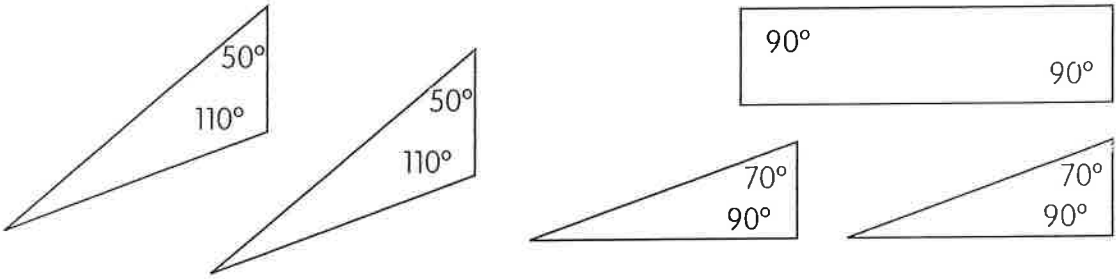
   Number of stations: _____

2. Before Catalina can install the washing machines, she needs to tile the floor with 1 ft by 1 ft tiles. How many tiles does she need to cover the floor? _____

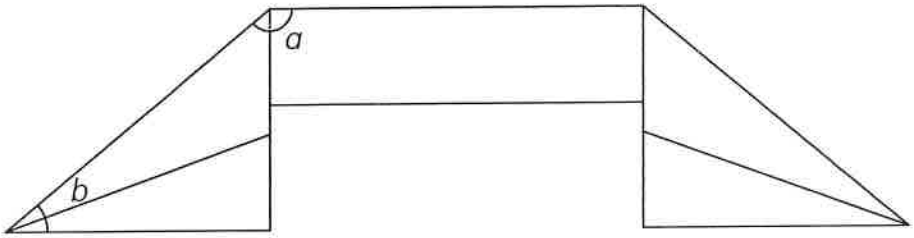
3. Use your measurements to sketch the floor plan of the dog grooming business. Label the parts of your sketch.

8k Real-World Angle Problems

Rafael wants to build a skateboard jump. He has four triangular pieces of wood and a rectangular piece of wood.



Rafael drew this design for his skateboard jump.

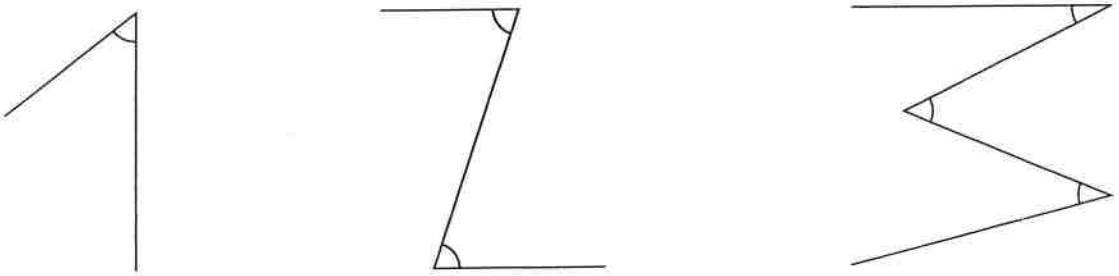


1. What is the measure of $\angle a$ in Rafael's design? _____°

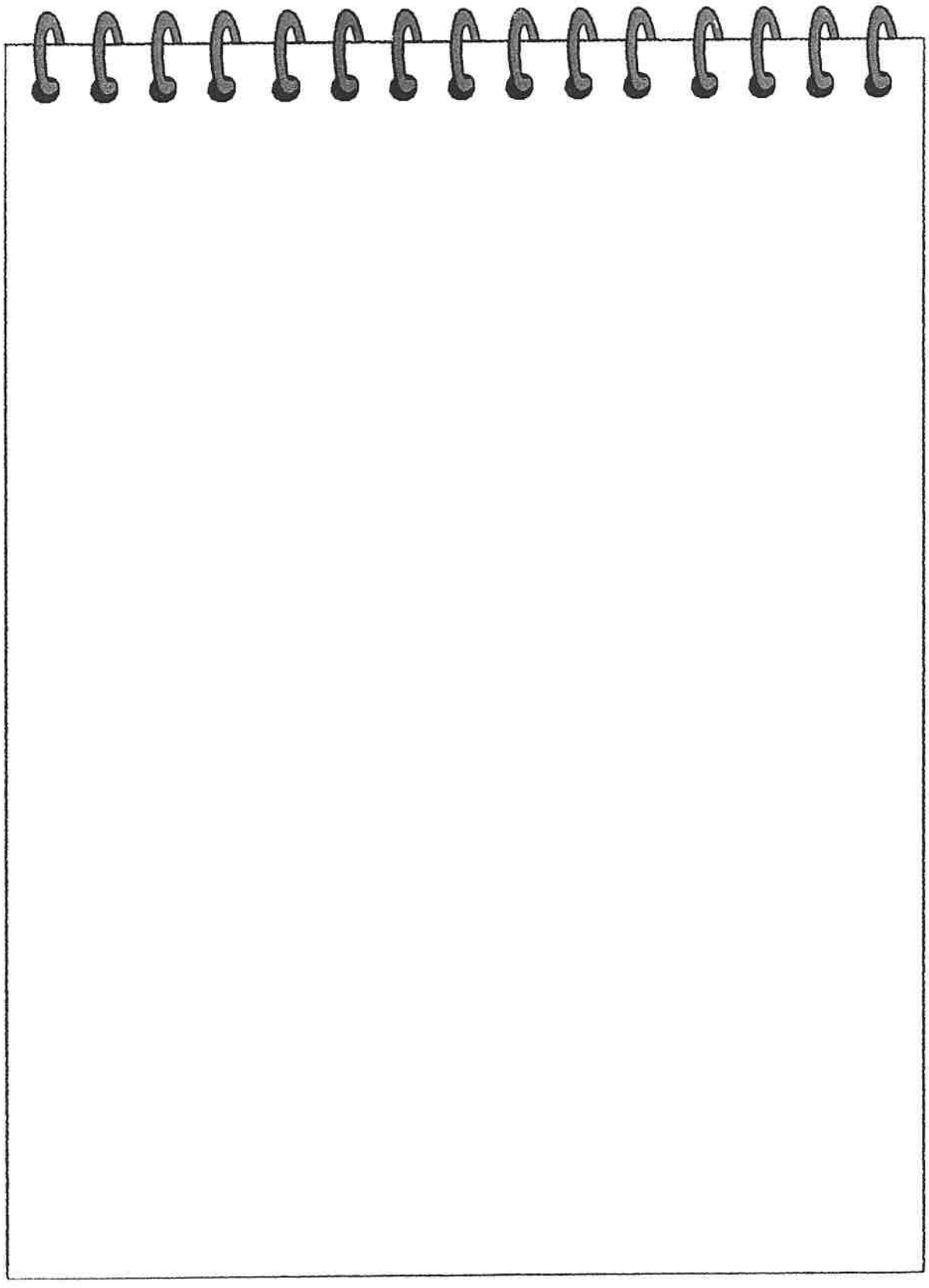
2. $\angle b$ is called the *angle of inclination*. What is the measure of $\angle b$? _____°

8l Angles

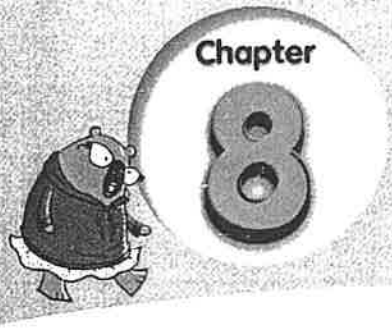
An artist used straight lines to draw the numerals 1, 2, and 3 so that the number of angles in each figure was the same as the numeral that the figure represented.



Draw the numerals 4–9 using straight lines so that each numeral represents the number of angles in the number.



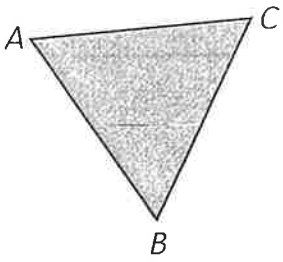
Name: _____ Date: _____



Extra Practice and Homework
Polygons

Activity 1 Classifying Triangles

Fill in each blank. Use a centimeter ruler and a protractor to identify each triangle as equilateral, isosceles, or scalene.

1 

AB = _____ cm

BC = _____ cm

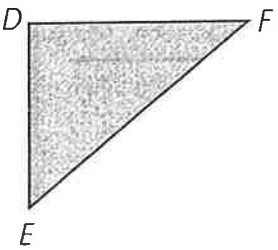
AC = _____ cm

$m\angle BAC$ = _____°

$m\angle ABC$ = _____°

$m\angle ACB$ = _____°

Triangle ABC is a/an _____ triangle.

2 

DE = _____ cm

EF = _____ cm

DF = _____ cm

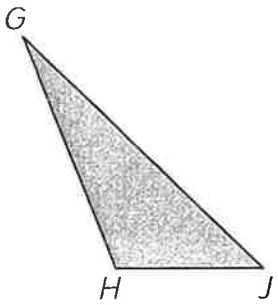
$m\angle EDF$ = _____°

$m\angle DEF$ = _____°

$m\angle DFE$ = _____°

Triangle DEF is a/an _____ triangle.

3



$GH =$ _____ cm

$HJ =$ _____ cm

$GJ =$ _____ cm

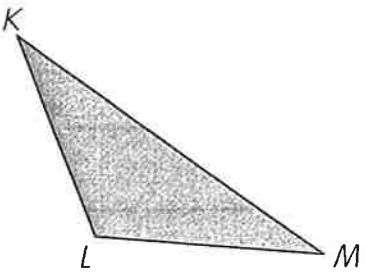
$m\angle HGJ =$ _____°

$m\angle GHJ =$ _____°

$m\angle GJH =$ _____°

Triangle GHJ is a/an _____ triangle.

4



$KL =$ _____ cm

$LM =$ _____ cm

$KM =$ _____ cm

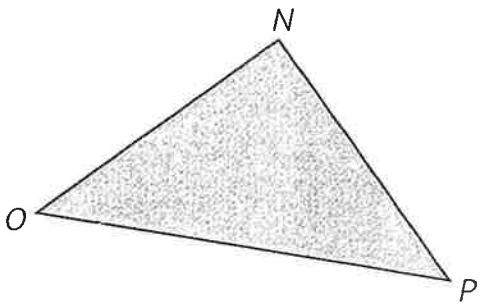
$m\angle LKM =$ _____°

$m\angle KLM =$ _____°

$m\angle KML =$ _____°

Triangle KLM is a/an _____ triangle.

5



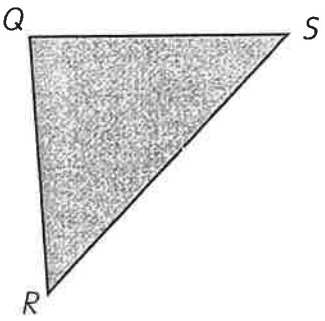
$NO =$ _____ cm $m\angle ONP =$ _____°

$OP =$ _____ cm $m\angle NOP =$ _____°

$NP =$ _____ cm $m\angle NPO =$ _____°

Triangle *NOP* is a/an _____ triangle.

6



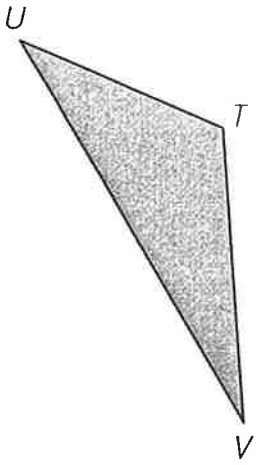
$QR =$ _____ cm $m\angle RQS =$ _____°

$RS =$ _____ cm $m\angle QRS =$ _____°

$QS =$ _____ cm $m\angle QSR =$ _____°

Triangle *QRS* is a/an _____ triangle.

7



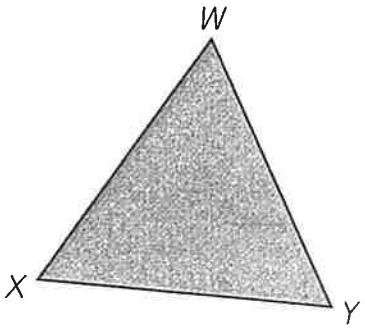
$TU =$ _____ cm $m\angle UTV =$ _____°

$UV =$ _____ cm $m\angle TUV =$ _____°

$TV =$ _____ cm $m\angle TVU =$ _____°

Triangle TUV is a/an _____ triangle.

8



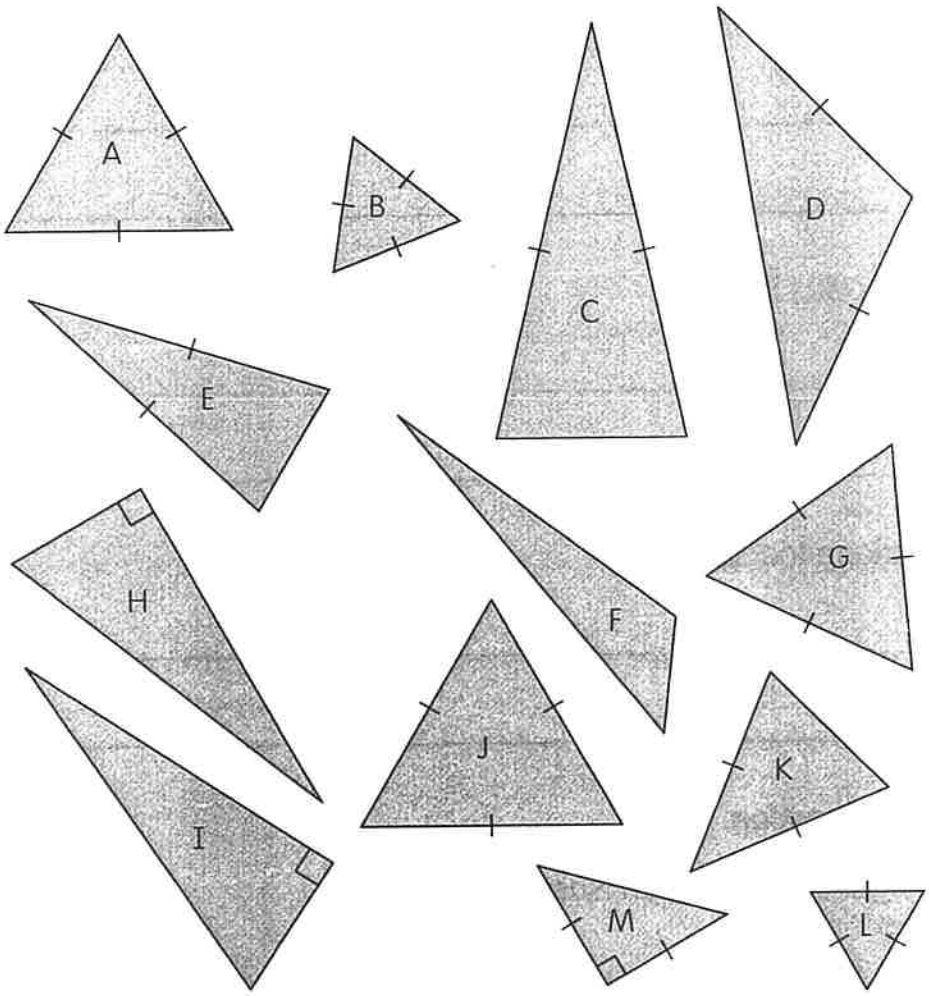
$WX =$ _____ cm $m\angle XWY =$ _____°

$XY =$ _____ cm $m\angle WXY =$ _____°

$WY =$ _____ cm $m\angle WYX =$ _____°

Triangle WXY is a/an _____ triangle.

Classify each triangle as equilateral, isosceles, or scalene.



9

Triangles		
Equilateral	**Isosceles**	**Scalene**

Explain how you have sorted the triangles in question 9.

10 **a** Equilateral triangles

_____

_____

b Isosceles triangles

_____

_____

c Scalene triangles

_____

_____

Answer each question.

11 Can a right triangle be an isosceles triangle?

_____

12 Can an isosceles triangle be an equilateral triangle?

_____

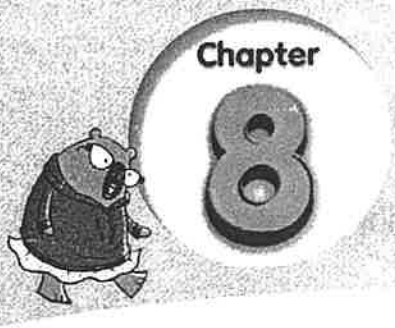
13 Are all equilateral triangles isosceles triangles?

_____

14 Can a right triangle be an equilateral triangle?

_____

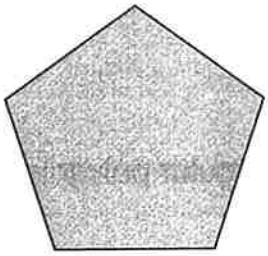
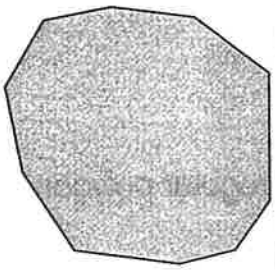
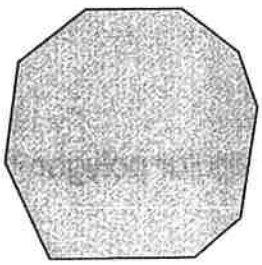
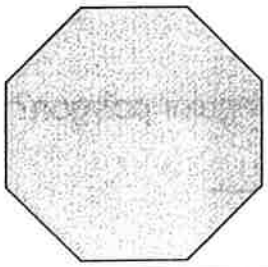
Name: _____ Date: _____

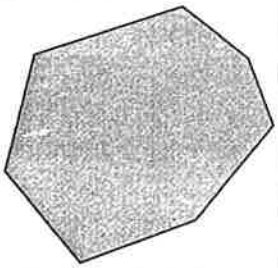
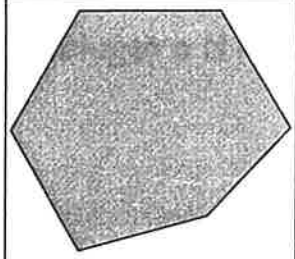
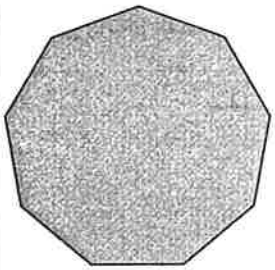
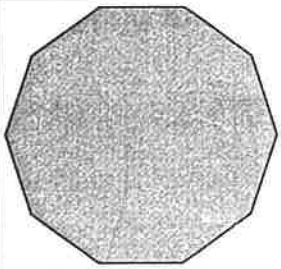
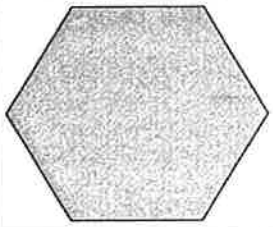
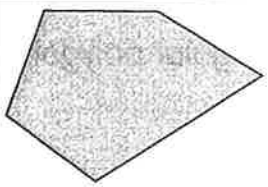


Extra Practice and Homework
Polygons

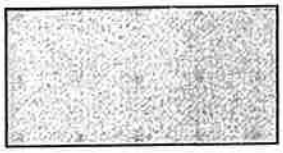
Activity 2 Classifying Polygons

Name each polygon. Then, identify whether each polygon is a regular polygon.

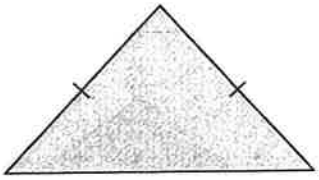
	Polygon	Name	
1			Is this a regular polygon? _____
2			Is this a regular polygon? _____
3			Is this a regular polygon? _____
4			Is this a regular polygon? _____

	Polygon	Name	
5			Is this a regular polygon? _____
6			Is this a regular polygon? _____
7			Is this a regular polygon? _____
8			Is this a regular polygon? _____
9			Is this a regular polygon? _____
10			Is this a regular polygon? _____

Write the name that best describes each polygon.

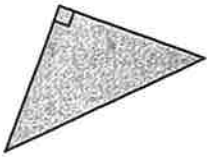


A

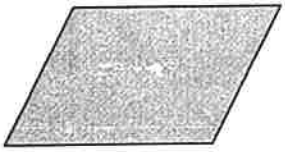


B

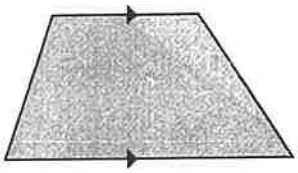
C



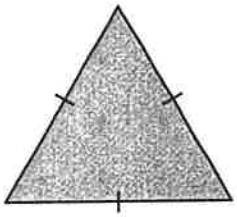
D



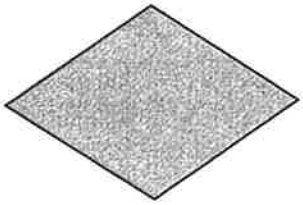
E



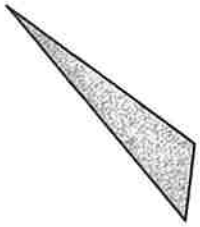
F



G



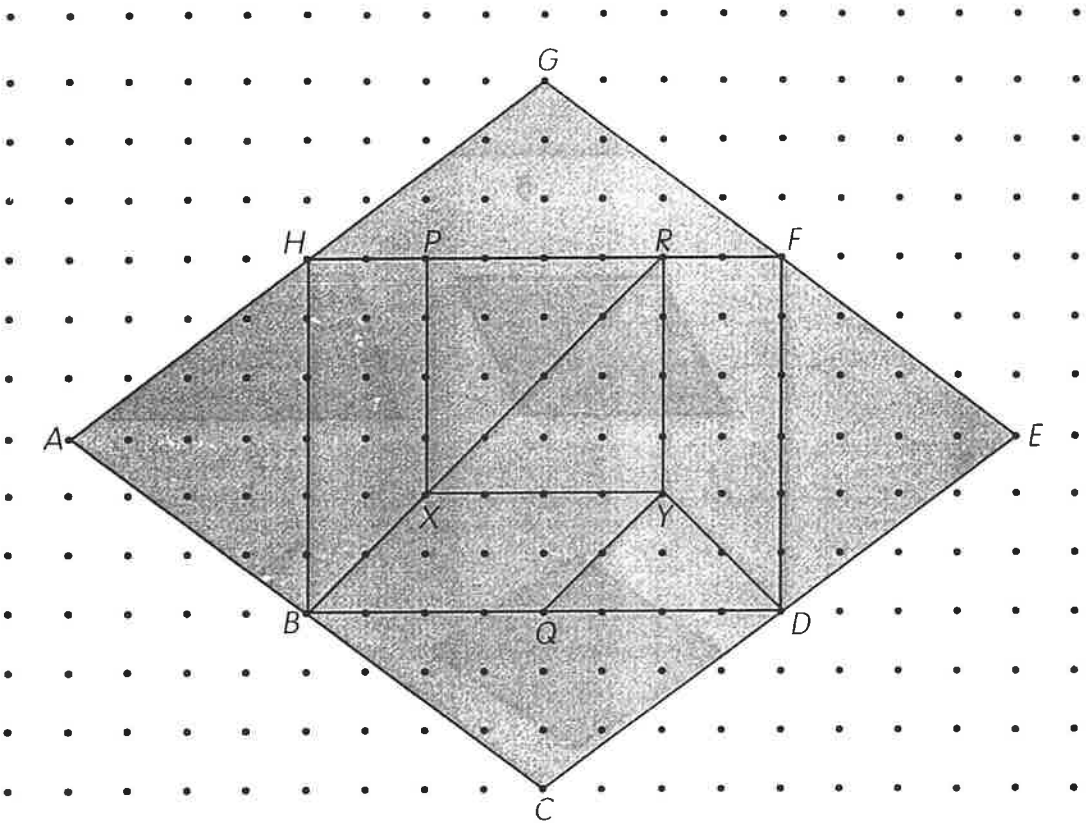
H



I

	Polygon	Name(s)
11	A	
12	B	
13	C	
14	D	
15	E	
16	F	
17	G	
18	H	
19	I	

Write the name that best describes each figure.



	Polygon	Name(s)
20	*HBDF*	
21	*BQYX*	
22	*RYDF*	
23	*PXYR*	
24	*BDYX*	
25	*ACEG*	

Name: _____ Date: _____

MATH JOURNAL

Mathematical Habit 5 **Use tool strategically**

Draw a mind map of polygons you have learned.

PUT ON YOUR THINKING CAP!

Mathematical Habit 3 **Construct viable arguments**

A square can be classified as other four-sided figures. Explain why this is possible. Draw diagrams to help you.