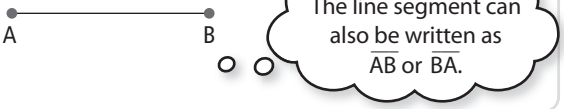
Get Ready

Name: _____ Date: _____

Identify Line Segments

A **line** is straight and extends without end in both directions.

A **line segment** is a part of a line between two points. It is named by its points. The line segment shown is named AB or BA.



1. There are eight line segments highlighted in this photo of a train bridge.

a) Name the eight line segments.

b) Record the length of each line segment to the nearest tenth of a centimetre.

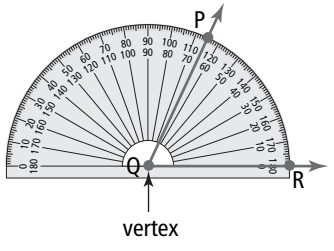
2. a) Which of the line segments in the photo have the same length?

b) Name two pairs of equal line segments.

Measure Angles

An **angle** is formed when two lines meet at a point called the **vertex.** An angle is named by the vertex and a point on each line. The middle point is the vertex. The angle shown is ∠PQR or ∠RQP.

No two letters in the name can be the same.



A protractor is used to measure the size of angles, in degrees. ∠PQR = 65°

3. What is the measure of each of these angles in the photo of the train bridge?

a) ∠ABE **b)** ∠DAE **c)** ∠DEC

4. On another sheet of paper, draw an angle with each measure shown. (Use a ruler and a protractor.) Use letters to name each angle.

a) 35° **b)** 90° **c)** 125°

Name: _____ Date: _____

Determine Area

Area measures the region inside a two-dimensional shape.
It is measured in square units. Examples of square units are

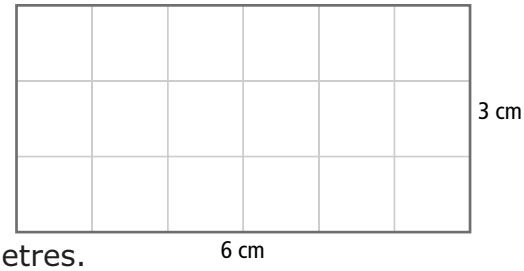
- square centimetres (cm^2)
- square metres (m^2)
- square kilometres (km^2)

One way to measure area is to count the number of square units inside a shape.

This rectangle contains 18 square centimetres.
The area is 18 cm^2.
Area can also be calculated using a formula:

A = length × width
$A = l \times w$
$A = 6 \times 3$
$A = 18$

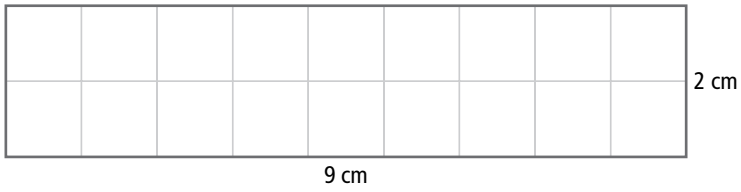
The area is 18 cm^2.



This rectangle also contains 18 square centimetres.
The area is calculated as shown:

$A = l \times w$
$A = 9 \times 2$
$A = 18$

The area is 18 cm^2.



5. What are the areas of the rectangles with the following lengths and widths?

a) 4 cm × 3 cm

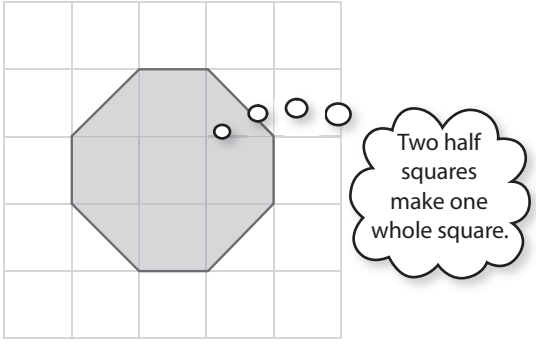
b) 6 cm × 2 cm

c) 6 cm × 8 cm

d) 4 cm × 12 cm

6. On another sheet of paper, draw three different rectangles that have an area of 16 cm^2. Show that the areas are equal.

7. The octagon shown was drawn on centimetre grid paper. What is its area?



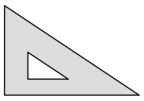
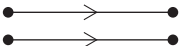
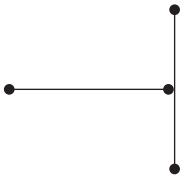
Name: _____ Date: _____

3.1 Parallel and Perpendicular Line Segments

***MathLinks 7*, pp. 82–88**

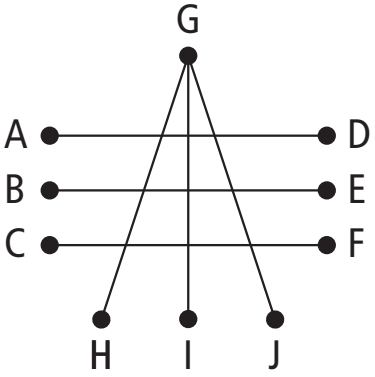
Key Ideas Review

Draw a line from the description in column A to the term or example in column B that best matches.

A	B
1. These line segments are in the same plane and do not intersect.	**a)** 
2. This must be the same between the ends of parallel line segments.	**b)** ruler
3. These line segments intersect at 90°.	**c)** 
4. a) Both parallel and perpendicular lines can be drawn using this method.	**d)** paper folding
b) Parallel line segments can also be drawn using a ruler and this tool.	**e)** 
c) Perpendicular line segments can also be drawn using a protractor and this tool.	**f)** distance

Practise and Apply

5. Use a Mira or paper folding to identify the parallel and perpendicular line segments in this diagram.



a) List the parallel line segments.

_____

b) List perpendicular line segments.

_____

6. a) Draw a line segment that is parallel to KL.

b) Draw a line segment that is perpendicular to KL.

Name: _____ **Date:** _____

7. **a)** Draw a 6-cm line segment PQ.

b) Draw two line segments that are parallel to PQ.

c) Draw two line segments that are perpendicular to PQ.

8. To answer this question, first print the alphabet in capital block letters.

_____

_____

a) Circle the letters that have parallel line segments.

b) Underline the letters that have perpendicular line segments.

c) How many letters have both parallel and perpendicular line segments?

9. Look at this watch face to help answer these questions.

a) Are the hands on the watch face parallel or perpendicular?

_____

b) At what time will the hands be parallel? _____

10. Draw a small bookshelf with three shelves full of books.

a) Which parts of your drawing are parallel?

_____

_____

b) Which parts are perpendicular?

_____

_____

11. Design a gate that has at least two sets of parallel lines and at least two perpendicular lines. Draw your design.

Name: _____ Date: _____

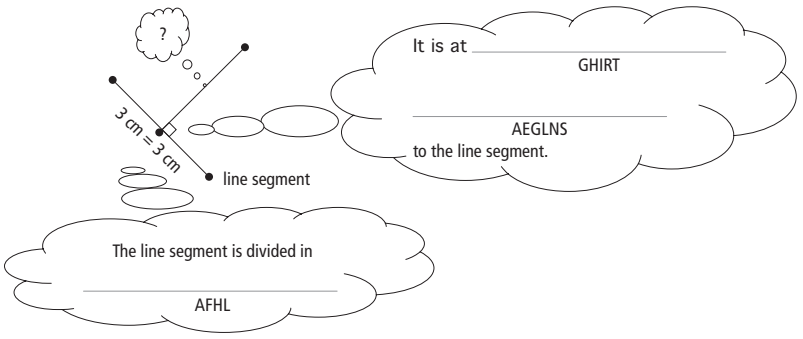
3.2 Draw Perpendicular Bisectors

***MathLinks 7*, pp. 89–93**

Key Ideas Review

1. An investigator's notes got smudged. Use your knowledge of geometry to figure out the smudged words and identify the suspect.

a) Sketch of the Scene



b) Based on the evidence, the unidentified line segment is thought to be a

_____ _____.

ACDEEILNPPRRU BCEIORST

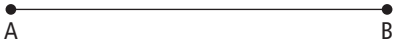
2. **a)** What tool can be used with a ruler to draw a perpendicular bisector of a line segment? _____

b) What other tool could you use? _____

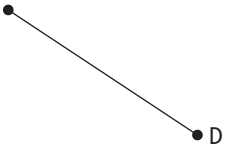
Practise and Apply

3. Use a compass to draw the perpendicular bisector for each line segment. Verify the perpendicular bisectors using a method of your choice.

a)



b)

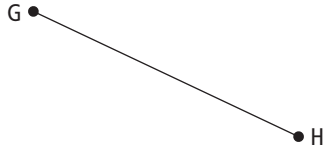


Name: _____ **Date:** _____

4. Use a ruler and a right triangle to draw a perpendicular bisector for each line segment. Verify the perpendicular bisectors using a method of your choice.

a)

b)



5. a) Explain how to use a Mira to verify that a line segment is a perpendicular bisector.

_____

_____

_____

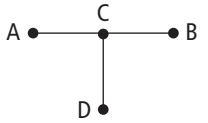
b) Explain how paper folding can do the same thing.

_____

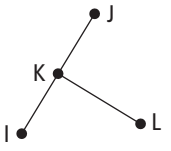
_____

6. Circle the line segments that are perpendicular bisectors. Verify using a method of your choice.

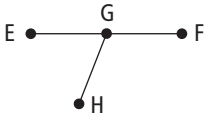
a)



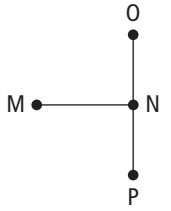
b)



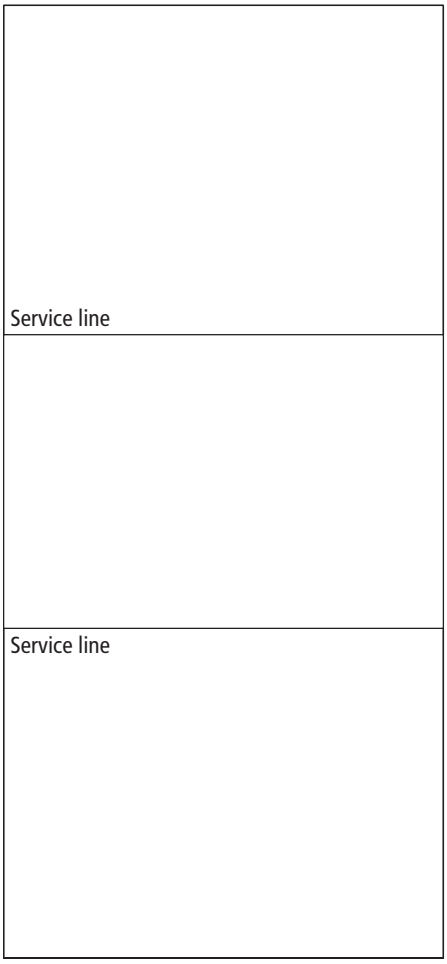
c)



d)



7. Asmahan has to lay down the lines for a badminton court. She is using this diagram to help figure out where the lines should go.



a) The net bisects the length of the court. Draw a line where the net should be.

b) Each service line is bisected by a service centre line. This divides each area into two equal halves. Draw this line.

Name: _____ Date: _____

3.3 Draw Angle Bisectors

***MathLinks 7*, pp. 94–99**

Key Ideas Review

Use these words to complete the sentences. Then, provide an example using the method of your choice.

compass	equal	folding	ruler

1. An angle bisector divides an angle into two _____ parts.

2. An angle bisector can be drawn using

a) a ruler and a _____ ,

b) a _____ and a protractor, or

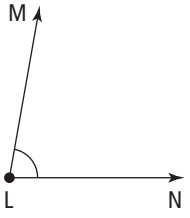
c) paper _____.

3. Draw and label an example of an angle bisector. Remember to use a symbol to show that the two angles are equal.

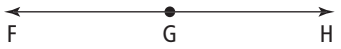
Practise and Apply

4. Draw the angle bisector for each of the following angles.

a)

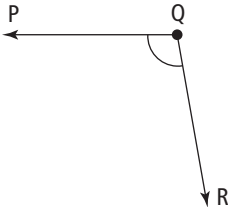


b)

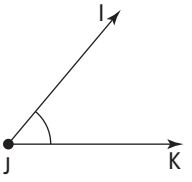


5. Draw the angle bisector for each of the following angles.

a)

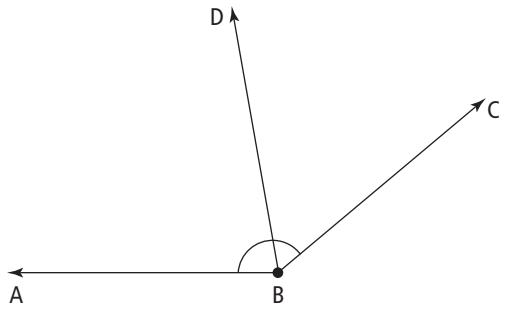


b)



Name: _____ **Date:** _____

6. a) Draw the angle bisector for ∠ABD and ∠DBC.



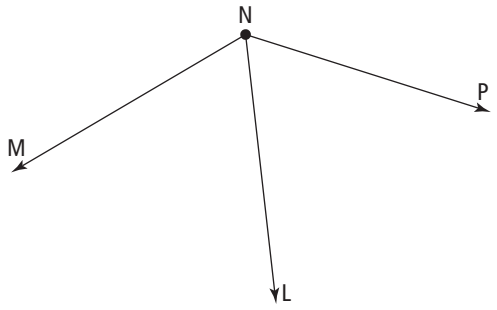
b) Which of the angle bisectors results in the largest angles?

_____

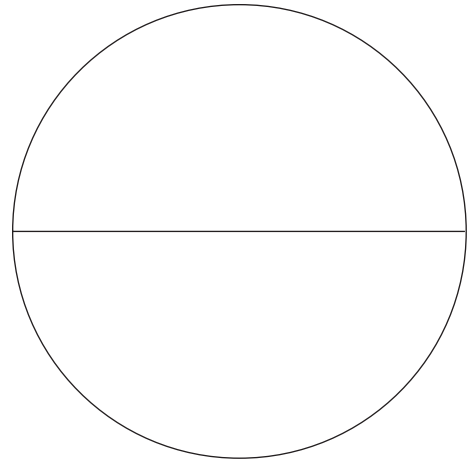
c) Which of the angle bisectors results in the smallest angles?

_____

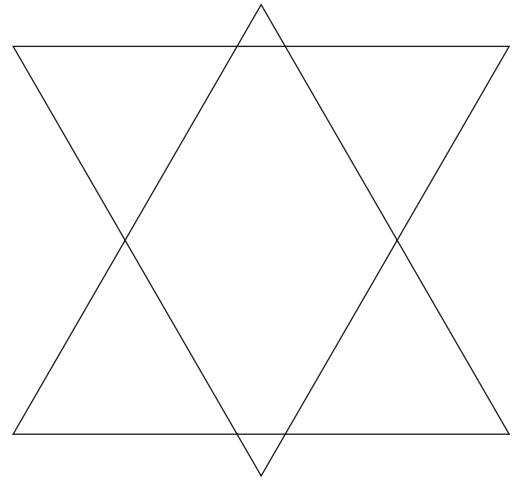
7. Is the line LN an angle bisector of ∠MNP? Verify your answer using a method of your choice.



8. Water wheels usually have eight spokes. Using the circle with the centre line as a starting angle, continue to bisect each angle to create eight equal sections.



9. Draw angle bisectors in the shape below. Then, colour it to create a design.



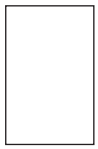
Name: _____ Date: _____

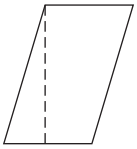
3.4 Area of a Parallelogram

***MathLinks 7*, pp. 100–107**

Key Ideas Review

Use the diagrams to help you answer #1–#3.





1. Label the base and the height of each shape.

2. **a)** The formula for the area of a rectangle is $A =$ _____ $\times$ _____

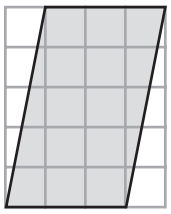
b) The formula for the area of a parallelogram is $A =$ _____ $\times$ _____

3. The height of the parallelogram is always _____ to its base.

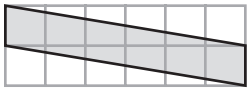
Practise and Apply

4. These parallelograms are drawn on a centimetre grid. What is the area of each parallelogram? Show your work.

a)

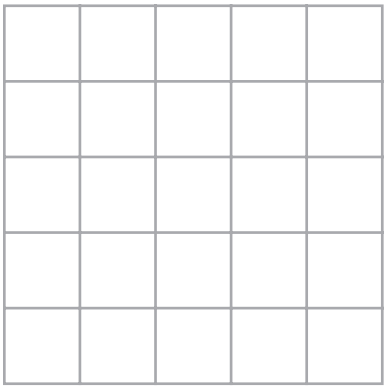


b)



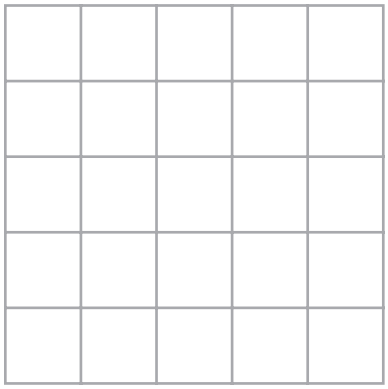
5. Draw each of the following parallelograms on the centimetre grid provided. Use the formula to determine the area of each parallelogram. Show your work. Check your answers using estimation.

a) The height is 3 cm and the base 3 cm.



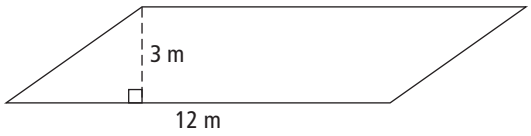
Name: _____ **Date:** _____

b) $b = 2$ cm, $h = 5$ cm



6. What is the area of each parallelogram? Show your work.

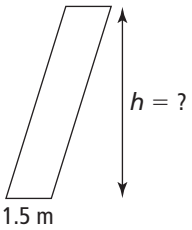
a)



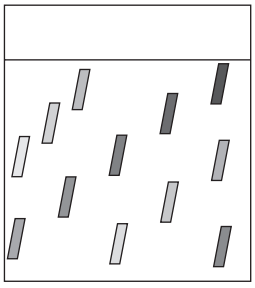
b) $b = 5$ cm, $h = 10.5$ cm

c) The base is 7.5 cm and the height is half the length of the base.

7. Paul's garden covers 6 m^2. If the base of the garden is 1.5 m, what is the height of his garden?



8. Vivian is designing cover art for a CD case. The small parallelograms on the cover have a base of 5 mm and a height of 25 mm. What total area is covered by these parallelograms? Show your work.



Name: _____ Date: _____

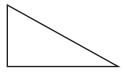
3.5 Area of a Triangle

***MathLinks 7*, pp. 108–115**

Key Ideas Review

Use the diagrams to help you fill in the blanks.

1. Label the base and the height of each shape.



2. a) The formula $A =$ _____ $\times$ _____ can be used to find the area of a rectangle.

b) The formula $A = \frac{b \times h}{\square}$ can be used to find the area of a triangle, where

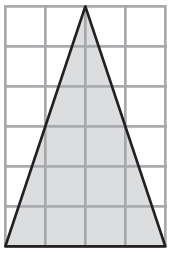
$b =$ _____ and $h =$ height.

3. The _____ of the triangle is always perpendicular to its base.

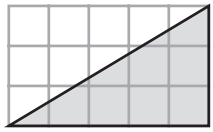
Practise and Apply

4. What is the area of each triangle shown on the centimetre grid? Show your thinking.

a)



b)

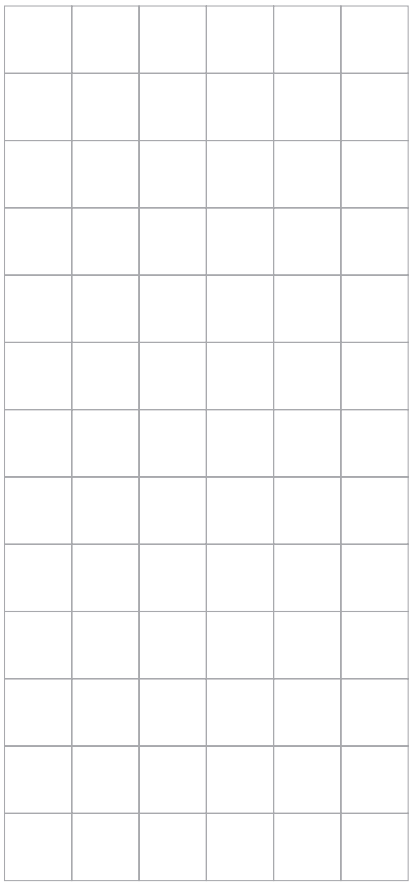


Name: _____ **Date:** _____

5. Draw each triangle on the grid provided. Use the formula to determine the area of each triangle. Show your work, then check your answers using estimation.

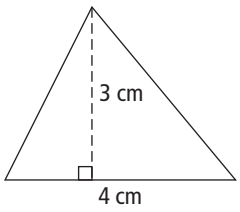
a) $b = 5$ cm, $h = 6$ cm

b) $b = 4$ cm, $h = 8$ cm



6. Calculate the area of each triangle.

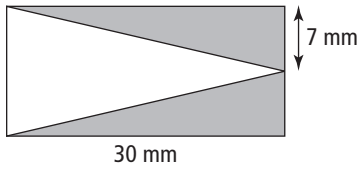
a)



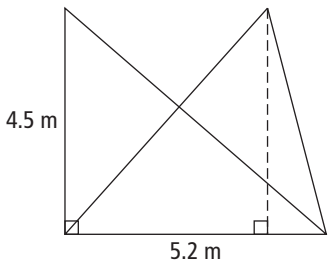
b) $b = 7.5$ m, $h = 6.8$ m

c) The base is 9.2 cm and the height is twice the length of the base.

7. Determine the area of the white triangle. Show your work.



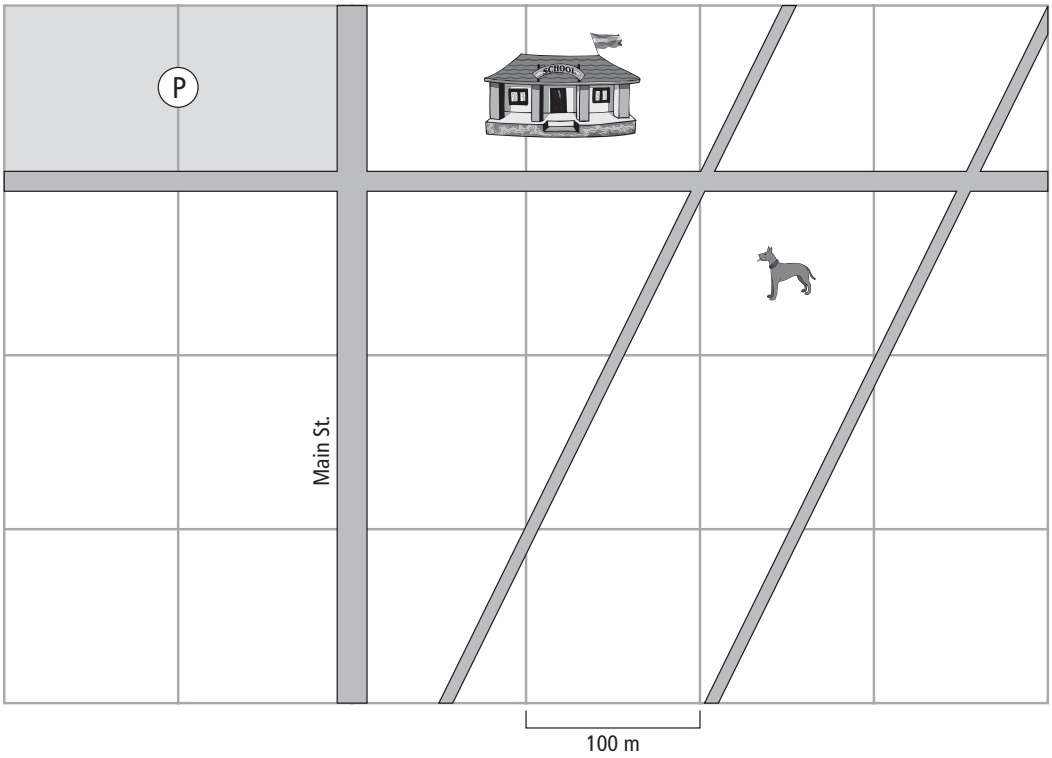
8. Do both of these triangles have the same area? Explain how you know.



Name: _____ Date: _____

Link It Together

The plan for this neighbourhood is drawn on a grid. Each square in the grid represents 100 m. There are areas set aside for a dog park and a school. Complete the map by following the steps below. Then, calculate the values requested.



1. a) Draw a street that is the perpendicular bisector of Main St. This street should stretch across the whole neighbourhood.

b) In the parking lot, draw a path from the intersection. This should be the angle bisector of the angle made by the streets.

2. a) Colour the parallel streets blue.

b) Colour the perpendicular streets red.

3. a) The dog park extends right to the edge of the streets around it. Colour the dog park green, then calculate its area. Show your work.

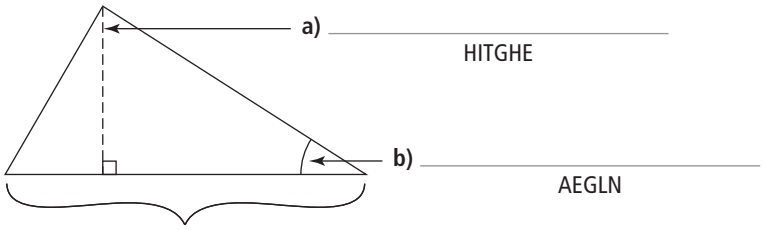
b) Colour in the part of the school yard that is a triangle. How much area is planned for the school property altogether? Show your work.

Name: _____ Date: _____

Vocabulary Link

Unscramble the letters below each blank to correctly label the diagrams.

1.

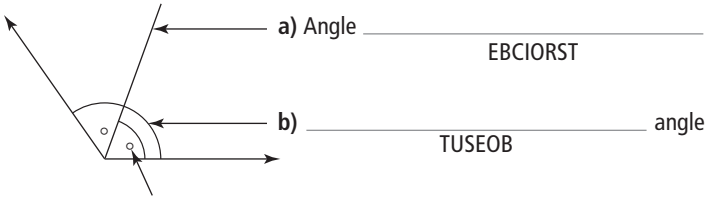


a) _____
HITGHE

b) _____
AEGLN

c) _____
EBSA

2.

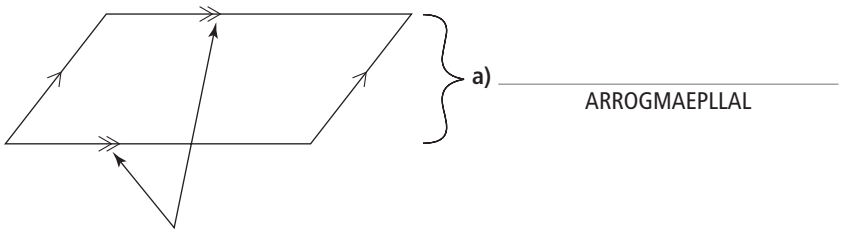


a) Angle _____
EBCIORST

b) _____ angle
TUSEOB

c) _____ angle
CAUTE

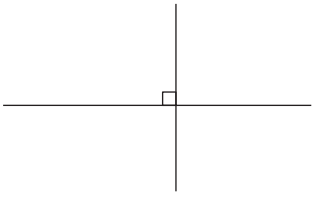
3.



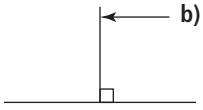
a) _____
ARROGMAEPLLAL

b) _____ lines
RLLEPLAA

4.



a) _____
NPUELEDPCARRI



b) Perpendicular _____
BCEIORST

3 m = 3 m