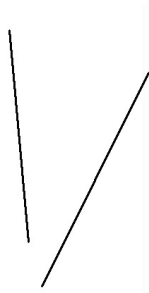


Extra Practice 1A

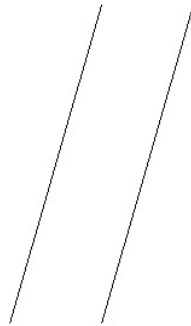
Lesson 8.1: Parallel Lines

1. Which line segments are parallel? How do you know?

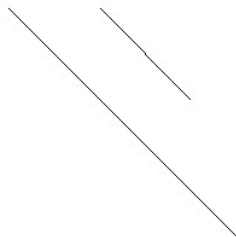
a)



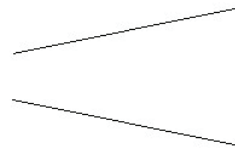
b)



c)



d)



2. Draw line segment MN of length 8 cm.

- Use a ruler to draw a line segment parallel to MN.
- Use a ruler and compass to draw a line segment parallel to MN.

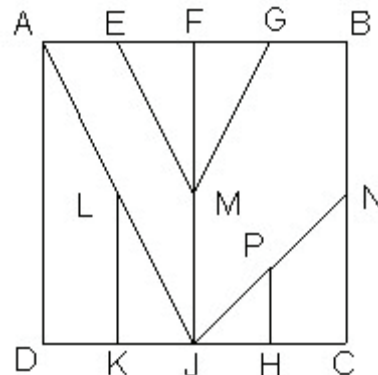
3. Look at the diagram.

Find as many pairs of parallel line segments as you can.

How do you know they are parallel?

4. Draw line segment JK.

Use what you know about parallel lines to draw an isosceles trapezoid, JKLM.

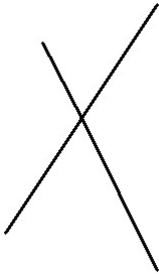


Extra Practice 2A

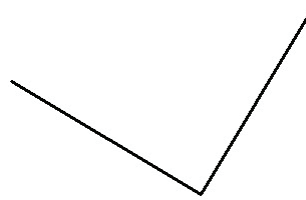
Lesson 8.2: Perpendicular Lines

1. Which line segments are perpendicular? How do you know?

a)



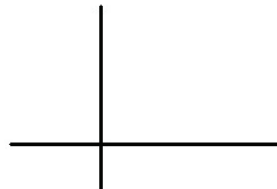
b)



c)



d)



2. Draw line segment PQ of length 5 cm.

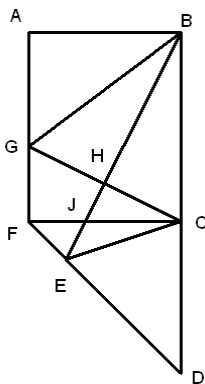
Mark a point S on line segment PQ.

Use three different methods to draw a perpendicular line through S.

How do you know the lines you drew using each method are perpendicular to the line segment?

3. Find as many pairs of perpendicular line segments as you can.

How do you know they are perpendicular?



Extra Practice 3A

Lesson 8.3: Constructing Perpendicular Bisectors

1. Draw line segment AB of length 7 cm.
 - a) Use Mira to draw its perpendicular bisector.
How do you know you have drawn the perpendicular bisector of AB?
 - b) Choose three different points on the bisector. Measure the distance to each point from A and B. What do you notice?

2. Draw line segment CD of length 9 cm.
 - a) Use a ruler and compass to draw its perpendicular bisector.
 - b) Choose three different points on the bisector. Measure the distance to each point from C and D. What do you notice?

3. Draw a large circle.
Label its centre O. Choose points M, N, P, and Q on the circle.
Construct the perpendicular bisector of line segments MN and PQ.
What do you notice about the perpendicular bisectors?

4. Construct the perpendicular bisectors of the sides of each shape.
What do you notice?

a)



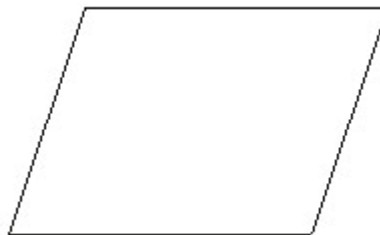
b)



c)



d)



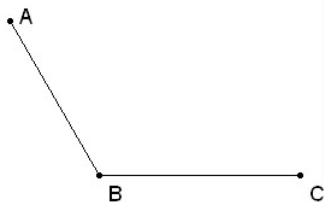
Extra Practice 4A

Lesson 8.4: Constructing Angle Bisectors

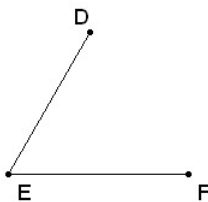
1. Use a Mira to bisect each angle.

Measure the two parts of each angle. Are they equal?

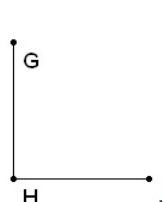
a)



b)



c)



2. Use a ruler and a compass.

a) Draw $\angle LKJ = 166^\circ$. Bisect the angle.

b) Draw $\angle MNO = 38^\circ$. Bisect the angle.

c) Draw $\angle PRS = 220^\circ$. Bisect the angle.

3. Draw any obtuse $\triangle KLM$ and acute $\triangle NPR$.

a) Construct the bisector of each angle using a different method each time.

Measure the two parts of each angle.

Are they equal?

b) What do you notice about the bisectors in each triangle?

Is this true for all obtuse triangles? Acute triangles?

4. Use what you know about bisecting angles.

Construct these angles using only a ruler and a compass.

a) 45°

b) 30°

c) 15°

Extra Practice 5A

Lesson 8.5: Graphing on a Coordinate Grid

1. Write the coordinates of each point from A to H.

A _____

B _____

C _____

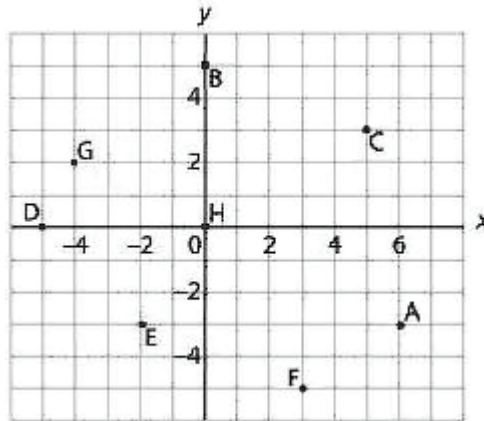
D _____

E _____

F _____

G _____

H _____



2. For each point in question 1, name the quadrant or axis that contains the point.

3. Use a 1-cm grid.

a) Plot the points $M(-4, 3)$ and $N(2, -1)$.

Join the points to form line segment MN .

What are the horizontal and the vertical distance between M and N ?

b) Plot the points $P(3, 5)$ and $Q(2, 1)$.

Join the points to form line segment PQ .

What is the horizontal distance between P and Q ?

4. a) Plot these points on a coordinate grid: $A(2, -4)$, $B(-3, 5)$, $C(-5, 0)$.

b) Find the area of triangle ABC .

c) Find point D in Quadrant 1 that forms parallelogram $ADBC$.

What are the coordinates of point D ?

Extra Practice 6A

Lesson 8.6: Graphing Translations and Reflections

1. Describe the horizontal and vertical distance required to move each point to its image.

a) $P(2, -3)$ to $P'(-3, 0)$

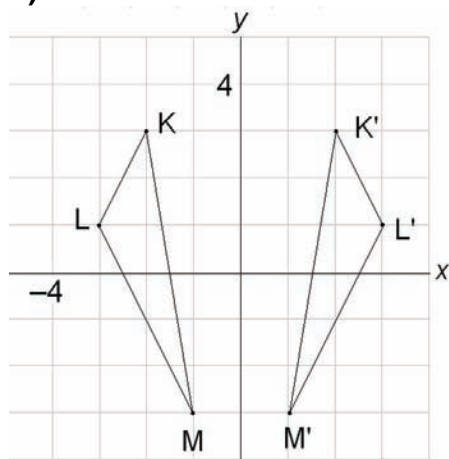
b) $R(-4, 2)$ to $R'(-2, 1)$

c) $S(-5, 5)$ to $S'(5, -3)$

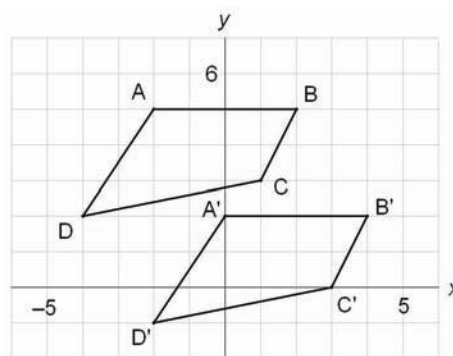
d) $T(3, -7)$ to $T'(-7, 3)$

2. Identify each transformation.

a)



b)



3. Plot these points on a coordinate grid: $M(3, -4)$, $N(2, 0)$, $P(5, 3)$, $Q(2, -3)$

a) Draw the image of quadrilateral $MNPQ$ after a reflection in the y -axis.

b) Draw its image after a reflection in the x -axis.

c) Draw its image after a translation 2 units left and 3 units up.

4. Plot these points on a coordinate grid: $C(-3, 2)$, $D(0, 4)$, $E(5, -2)$.

a) Translate each point 1 unit right and 4 units down to get image points C' , D' , E' .

b) Write the coordinates of each point and its translation image. What pattern do you see in the coordinates?

5. Plot the points in question 4.

a) Reflect each point in the y -axis to get image points C' , D' , E' . Write the coordinates of each point and its reflection image. What pattern do you see in the coordinates?

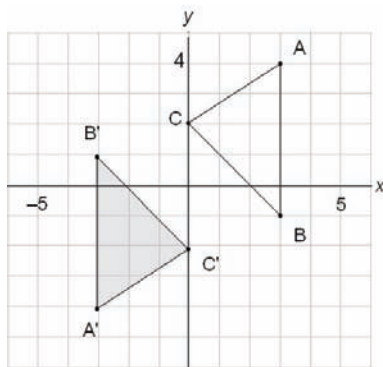
b) Reflect each point in the x -axis to get image points C'' , D'' , E'' . Write the coordinates of each point and its reflection image. What pattern do you see in the coordinates?

Extra Practice 7A

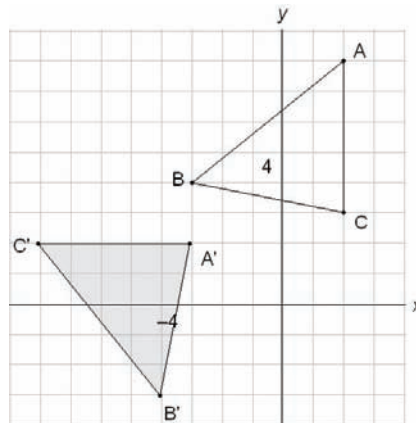
Lesson 8.7: Graphing Rotations

- Which clockwise rotation is the same as a 35° counterclockwise rotation?
 - Which clockwise rotation is the same as a 140° counterclockwise rotation?
 - Which clockwise rotation is the same as a 350° counterclockwise rotation?
- In each diagram, $\triangle A'B'C'$ is the image of $\triangle ABC$ after a rotation about the origin. Identify each rotation.

a)



b)



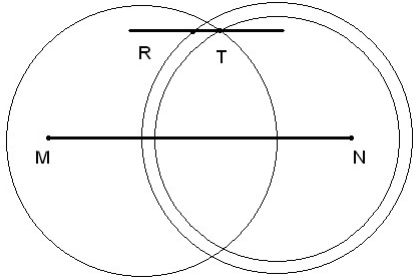
- Plot these points on a coordinate grid: $P(3, 5)$, $R(-2, -2)$, $S(4, 0)$
 - Rotate each point -90° about the origin to get image points P' , R' , S' .
 - Write the coordinates of each point and its rotation image.
What patterns do you see in the coordinates?
- Plot the points in question 3.
 - Rotate each point -180° about the origin to get image points P' , R' , S' .
Write the coordinates of each point and its rotation image.
What patterns do you see in the coordinates?
 - Rotate each point $+90^\circ$ about the origin to get image points P'' , R'' , S'' .
Write the coordinates of each point and its rotation image.
What patterns do you see in the coordinates?

Extra Practice Sample Answers

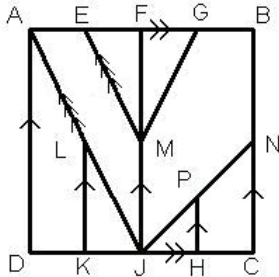
Extra Practice 1A

Lesson 8.1

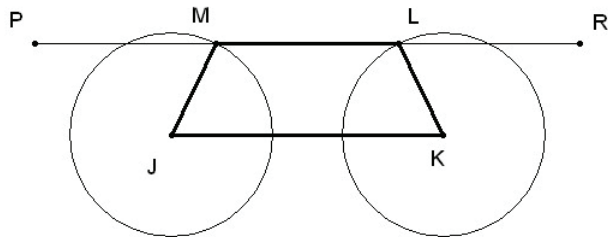
- Parts b and c; the lines never meet.
- b) I use a ruler and a compass to draw RT parallel to MN .



- AD , LK , FJ , PH , and BC ; AB and DC ; AJ and EM



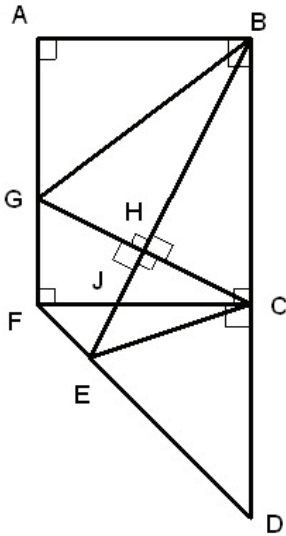
- Methods may vary. I use a ruler to draw line segment PR parallel to JK . Then, I use a compass to draw 2 circles of equal radii with centres in J and K . The two circles intersect line segment PR at M and L . $MJ = LK$, so trapezoid $JKLM$ is isosceles.



Extra Practice 2A

Lesson 8.2

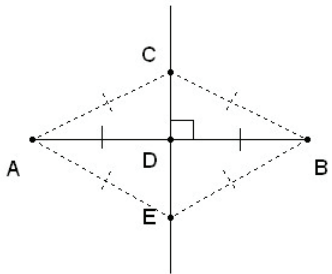
1. Parts b and d; the lines intersect at right angles.
2. I used a Mira, a ruler and a protractor, and a right triangle to draw a line through S perpendicular to PQ.
3. GA and AB, AF and FC, EH and GC, AB and BC, GH and EB, GC and AB, FC and BD.



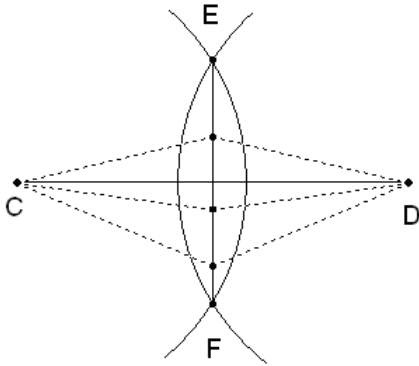
Extra Practice 3A

Lesson 8.3

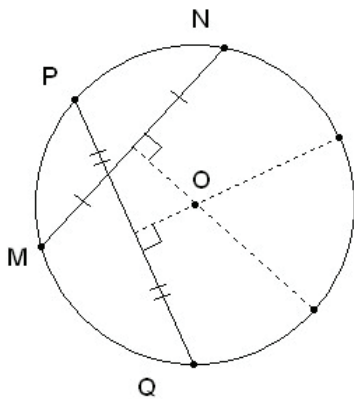
1. a) The perpendicular bisector divides line segment AB in two equal parts and intersects line segment AB at 90° .
 b) The distances from A and from B to C, to D, and to E are equal.



2. The distances from C and from D to any point on the perpendicular bisector are equal.



3. The perpendicular bisectors of line segments MN and PQ pass through the centre of the circle.

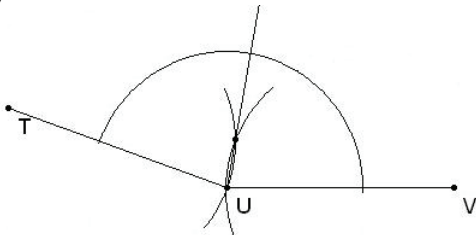


4. Observations may vary. For example:
- In a right triangle, the perpendicular bisectors meet at the midpoint of the hypotenuse. The perpendicular bisectors intersect at the centre of the circle drawn through the vertices.
 - In a square, the perpendicular bisectors meet at the centre of the circle drawn through its vertices.
 - In a square, the perpendicular bisectors meet at the centre of the circle drawn through its vertices.
 - In a parallelogram, the perpendicular bisectors intersect at 4 different points. I cannot draw a circle through all 4 vertices.

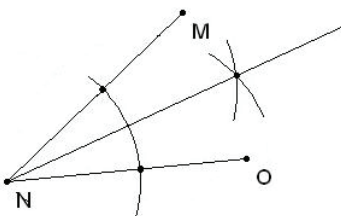
Extra Practice 4A

Lesson 8.4

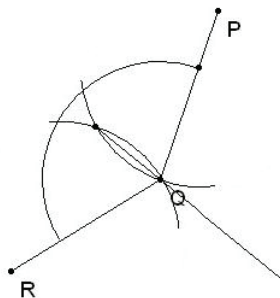
1. a) Yes; 60° b) Yes; 30° c) Yes; 45°
 2. a)



b)



c)



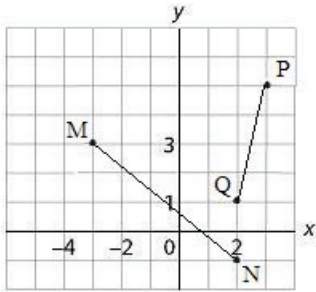
3. a) I use a right triangle to draw the bisectors of each angle in $\triangle KLM$ and $\triangle NPR$.
Yes, the angles are equal.
- b) The point where the bisectors meet is the centre of the circle that touches each side of the triangle.
This is true for all triangles.
4. a) I draw a right angle, then I use the ruler and compass to bisect the angle.
Each angle formed measures 45° .
- b) I draw an equilateral triangle and I bisect one of its angles.
Each angle formed measures 30° .
- c) I bisect the 30° angle in part b. Each angle formed measures 15° .

Extra Practice 5A

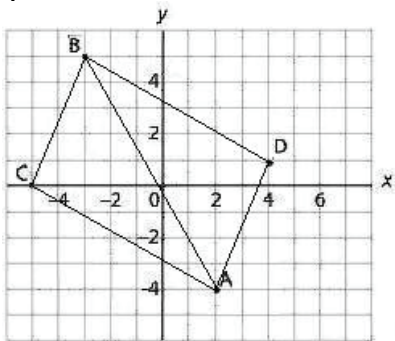
Lesson 8.5

1. A(6, -3), B(0, 5), C(5, 3), D(-5, 0), E(-2, -3), F(3, -5), G(-4, 2), H(0, 0)
2. A: Quadrant 4
B: y-axis
C: Quadrant 1
D: x-axis
E: Quadrant 3
F: Quadrant 4
G: Quadrant 2
H: both x- and y-axes

3.



- a) horizontal distance: 5 units;
vertical distance: 4 units
 - b) horizontal distance: 1 unit;
vertical distance: 4 units
4. a)



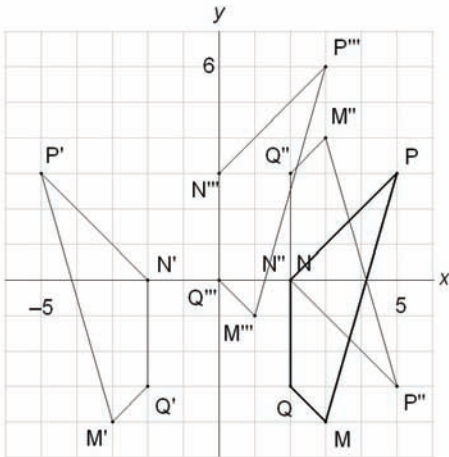
- b) 21.5 square units
- c) D(4, 1)

Extra Practice 6A

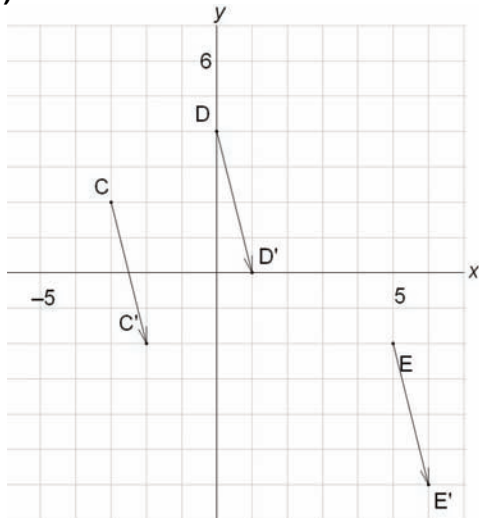
Lesson 8.6

1.
 - a) 5 units left and 3 units up
 - b) 2 units right and 1 unit down
 - c) 10 units right and 8 units down
 - d) 10 units left and 10 units up
2.
 - a) Reflection in the y -axis
 - b) Translation 2 units right and 3 units down

3. a), b), c), d)

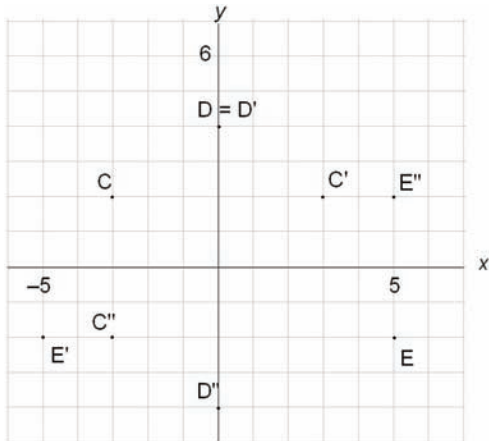


4. a)



b) $C(-3, 2), D(0, 4), E(5, -2) \rightarrow C'(-2, -2), D'(1, 0), E'(6, -6)$
 The x-coordinates increase by 1, the y-coordinates decrease by 4.

5.



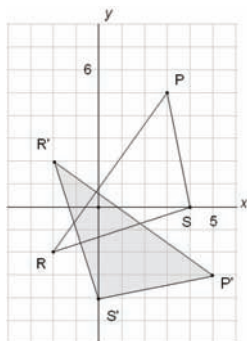
a) $C(-3, 2), D(0, 4), E(5, -2) \rightarrow C'(3, 2), D'(0, 4), E'(-5, -2)$
 The sign of the x-coordinates changes; the y-coordinates are unchanged.
 b) $C(-3, 2), D(0, 4), E(5, -2) \rightarrow C''(-3, -2), D''(0, -4), E''(5, 2)$

The x-coordinates are unchanged; the sign of the y-coordinates changes.

Extra Practice 7A

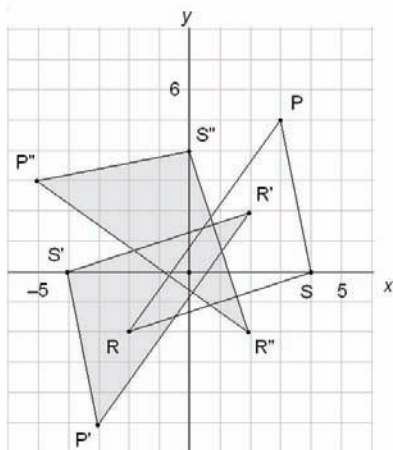
Lesson 8.7

1. a) 325° b) 220° c) 10°
2. a) 180° about the origin b) $+90^\circ$ about the origin
3. a)



- b) $P(3, 5) \rightarrow P'(5, -3)$
 $R(-2, -2) \rightarrow R'(-2, 2)$
 $S(4, 0) \rightarrow S'(0, -4)$
 The x- and y-coordinates are interchanged.
 Then the x-coordinates change sign.

4.



- a) $P(3, 5) \rightarrow P'(-3, -5)$
 $R(-2, -2) \rightarrow R'(2, 2)$
 $S(4, 0) \rightarrow S'(-4, 0)$
 The x- and y-coordinates change sign.
- b) $P(3, 5) \rightarrow P''(-5, 3)$
 $R(-2, -2) \rightarrow R''(2, -2)$
 $S(4, 0) \rightarrow S''(0, 4)$
 The x- and y-coordinates are interchanged.
 Then the x-coordinates change sign.