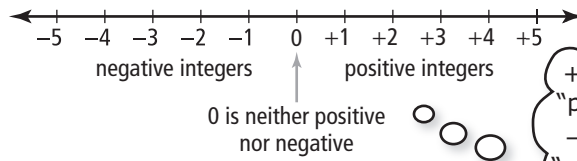


# Get Ready

Name: \_\_\_\_\_ Date: \_\_\_\_\_

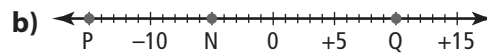
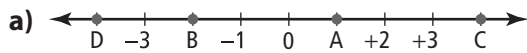
## Plot Integers on a Number Line

**Integers** include positive numbers, negative numbers, and zero. Integers can be shown on a number line.



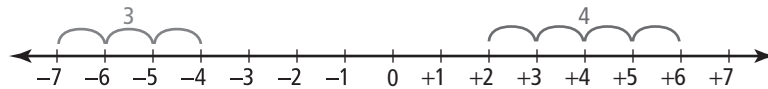
+1 is read as "positive one."  
-1 is read as "negative one."

1. For each letter on the number lines, identify the integer.



## Find the Distance Between Points on a Number Line

The distance between two points on a number line can be determined by counting.



2. What is the distance between the two numbers placed on a number line?

- a) 4 and 10 \_\_\_\_\_
- b) -2 and -8 \_\_\_\_\_
- c) -12 and -3 \_\_\_\_\_
- d) +7 and -3 \_\_\_\_\_
- e) -12 and 12 \_\_\_\_\_

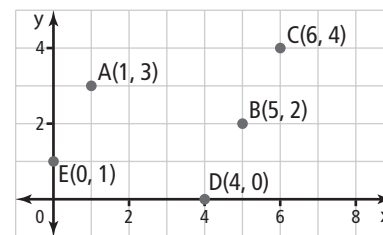
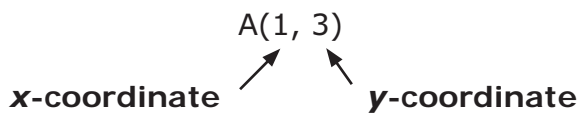
3. Draw an integer number line.

- a) Mark the point that is four less than zero. Label it A.
- b) Mark the point that is three more than zero. Label it B.
- c) Mark the point that is 7 more than -2. Label it C.

## Plot Points on a Coordinate Grid

The points A(1, 3), B(5, 2), C(6, 4), D(4, 0), and E(0, 1) can be plotted on a coordinate grid.

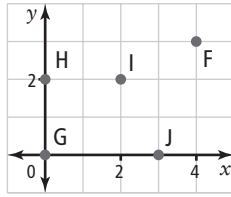
Each point is named with an **ordered pair**.



Name: \_\_\_\_\_

Date: \_\_\_\_\_

4. State an ordered pair for each point on the coordinate grid.

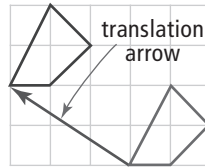


- F \_\_\_\_\_  
 G \_\_\_\_\_  
 H \_\_\_\_\_  
 I \_\_\_\_\_  
 J \_\_\_\_\_

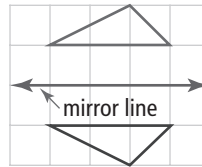
### Identify Transformations

A transformation moves one geometric figure onto another. Three types of transformations are translation, reflection, and rotation.

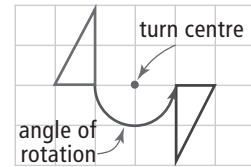
A translation is a slide.



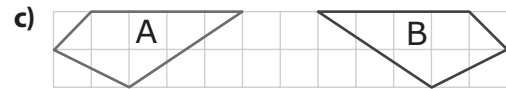
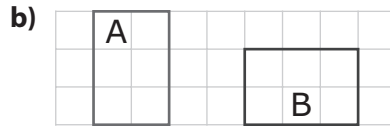
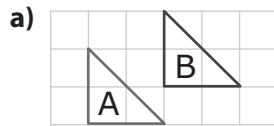
A reflection is a mirror image.



A rotation is a turn.

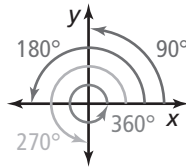


5. What is a transformation that moves Figure A onto Figure B?

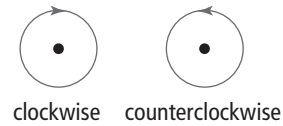


### Identify Angles of Rotation

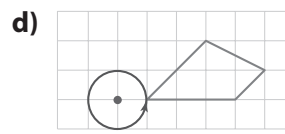
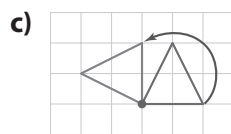
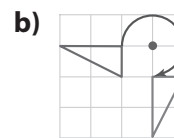
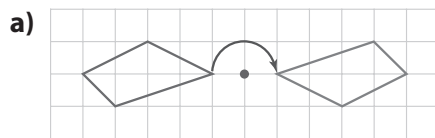
A figure can be turned or rotated any number of degrees.



The rotation can be clockwise or counterclockwise.



6. What is the angle of rotation for each of the following rotations?  
 Is the rotation clockwise or counterclockwise?



Name: \_\_\_\_\_

Date: \_\_\_\_\_

# 1.1 The Cartesian Plane

*MathLinks 7, pages 4–11*

## Key Ideas Review

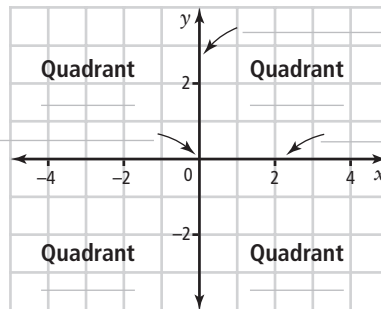
Choose from the following terms to complete #1 and #2.

I II III IV Cartesian origin plane quadrant x-axis y-axis

1. Complete each statement.

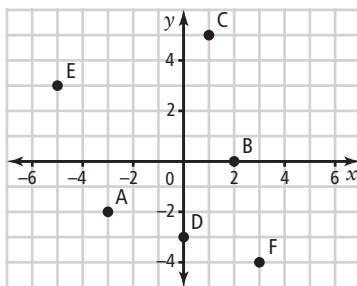
- a) An ordered pair  $(x, y)$  is used to locate any point on a \_\_\_\_\_ plane.
- b) All points located within the same \_\_\_\_\_ have the same signs for their  $x$ -coordinates and the same signs for their  $y$ -coordinates.

2. Fill in the blanks on the diagram.



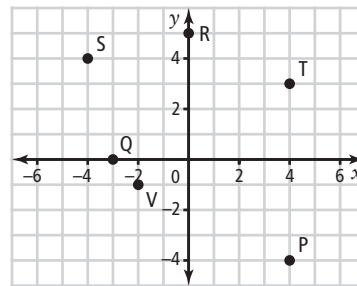
## Practise and Apply

3. What are the coordinates of each point shown on the coordinate grid?



- A \_\_\_\_\_ B \_\_\_\_\_  
 C \_\_\_\_\_ D \_\_\_\_\_  
 E \_\_\_\_\_ F \_\_\_\_\_

4. Identify the letter on the coordinate grid that matches each ordered pair.

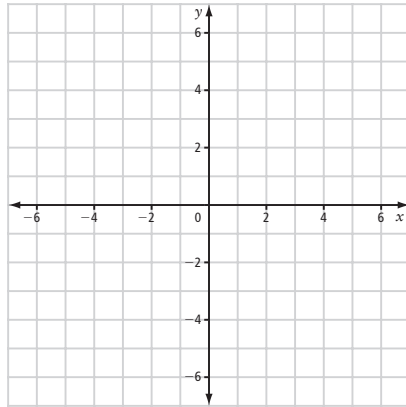


- a)  $(0, 5)$  \_\_\_\_\_ b)  $(-2, -1)$  \_\_\_\_\_  
 c)  $(4, -4)$  \_\_\_\_\_ d)  $(-4, 4)$  \_\_\_\_\_  
 e)  $(-3, 0)$  \_\_\_\_\_ f)  $(4, 3)$  \_\_\_\_\_

Name: \_\_\_\_\_

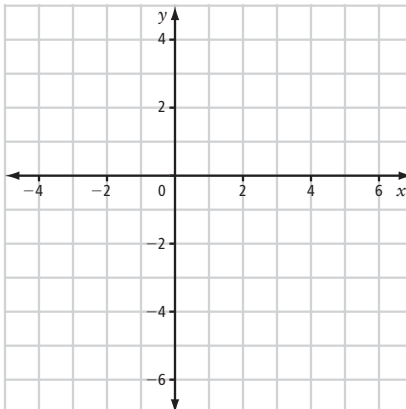
Date: \_\_\_\_\_

5. a) Plot each ordered pair on the coordinate grid:  $A(-2, -3)$ ,  $B(-2, 4)$ ,  $C(1, 2)$ ,  $D(4, 4)$ ,  $E(4, -3)$ .



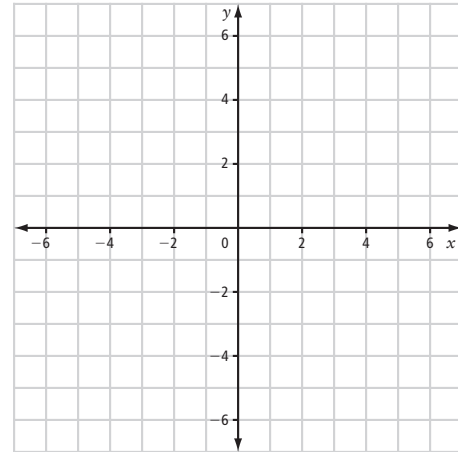
- b) Connect A to B, B to C, C to D, and D to E. What shape did you create?

6. a) Create a square by plotting and connecting points  $P(5, 1)$ ,  $Q(5, -5)$ ,  $R(-1, -5)$ , and  $S(-1, 1)$ .



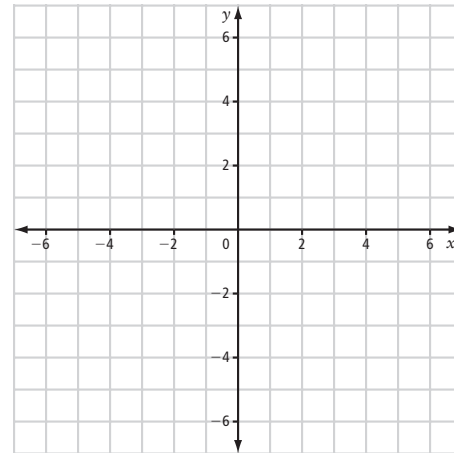
- b) What is the area of the square? Show how you know.
- c) What is the perimeter of the square? Show how you know.

7. a) Create a rectangle by plotting two points in quadrant I and two points in quadrant IV, and connecting the points.



- b) Write the coordinates of each vertex on the grid.
- c) What is the length of each side of the rectangle?

8. a) Create an isosceles right triangle that has each vertex in a different quadrant.



- b) Write the coordinates of each vertex on the grid.
- c) Show how you know the triangle is isosceles.

Name: \_\_\_\_\_

Date: \_\_\_\_\_

# 1.2

## Create Designs

MathLinks 7, pages 12–17

### Key Ideas Review

1. What steps should you take to draw a design on a coordinate grid? Write the step number from column B that matches each description in column A.

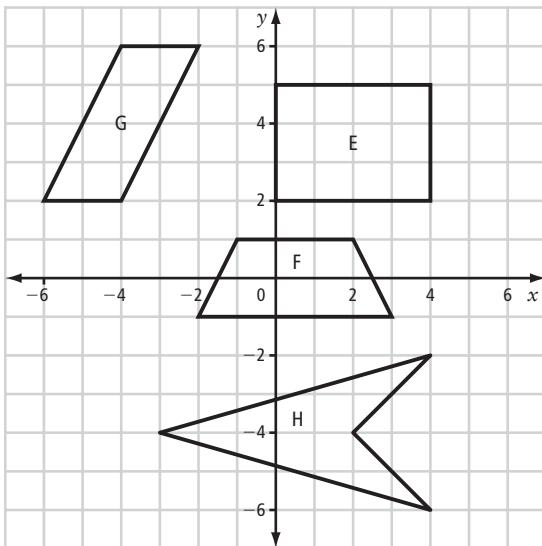
A	B
a) Connect the vertices to make the design. _____	Step 1
b) Plot the vertices of the design. _____	Step 2
c) Colour the design, if it has colour. _____	Step 3
d) Identify the vertices and name their coordinates. _____	Step 4

2. A figure has the following coordinates: R(2, 4), S(-5, 4), T(-5, -1), U(2, -1).

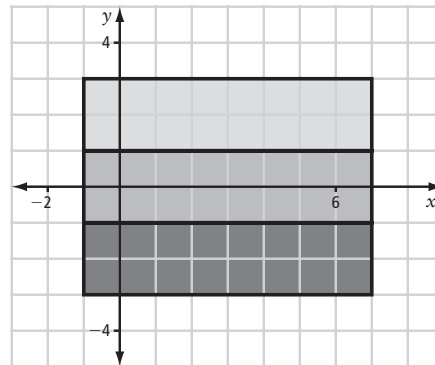
- a) Label the x-axis from at least \_\_\_\_\_ to \_\_\_\_\_.
- b) Label the y-axis from at least \_\_\_\_\_ to \_\_\_\_\_.

### Practise and Apply

3. Write the coordinates of the vertices of figures E, F, G, and H on the grid.



4. a) For the following design, write the coordinates of the vertices on the grid.

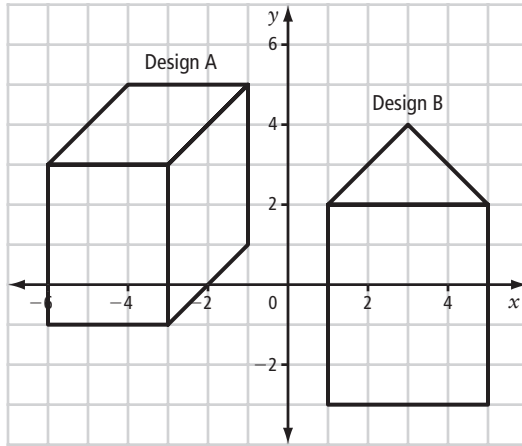


b) Describe the steps you would follow to copy the design.

Name: \_\_\_\_\_

Date: \_\_\_\_\_

5. a) For each of the following designs, write the coordinates of the vertices on the grid.



- b) What steps would you follow to copy each design?

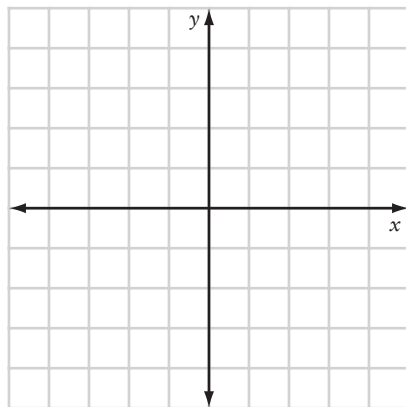
- b) Connect the dots in this order: A, B, C, D, A, E, F, G, A, H, I, J, A, K, L, M, A.

Describe the design.

7. a) Draw a coordinate grid of quadrant I only.



6. a) Label the coordinate grid from  $-4$  to  $4$ . Draw a design by plotting the following points:  
 $A(0, 0)$ ,  $B(-1, -2)$ ,  
 $C(-2, 2)$ ,  $D(-1, 0)$ ,  $E(-2, 1)$ ,  
 $F(-2, 2)$ ,  $G(0, 1)$ ,  $H(1, 2)$ ,  
 $I(2, 2)$ ,  $J(1, 0)$ ,  $K(2, -1)$ ,  
 $L(2, -2)$ ,  $M(0, -1)$ .



- b) Label the axes by 2s from 0 to 10.  
 c) Plot the following points on the grid:  $R(2, 9)$ ,  $S(7, 9)$ ,  $T(7, 1)$ ,  $V(2, 1)$ .  
 d) Connect  $R$  to  $S$ ,  $S$  to  $T$ ,  $T$  to  $V$ , and  $V$  to  $R$ .  
 e) What figure have you drawn?

- f) List the length and width of the figure as an ordered pair  $(l, w)$ .

Name: \_\_\_\_\_

Date: \_\_\_\_\_

# 1.3 Transformations

*MathLinks 7, pages 18–29*

## Key Ideas Review

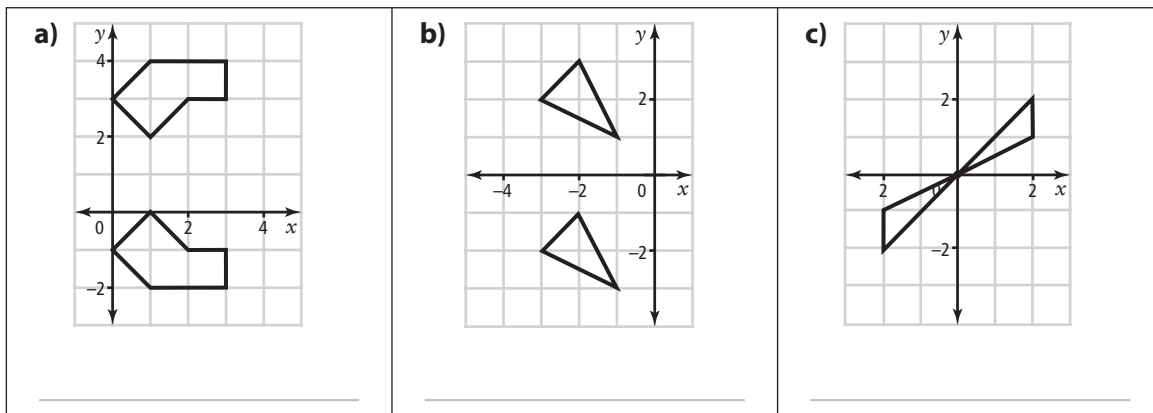
Choose from the following terms to complete #1.

centre of rotation    point    transformation    translation    reflection    rotation

1. Complete each statement.

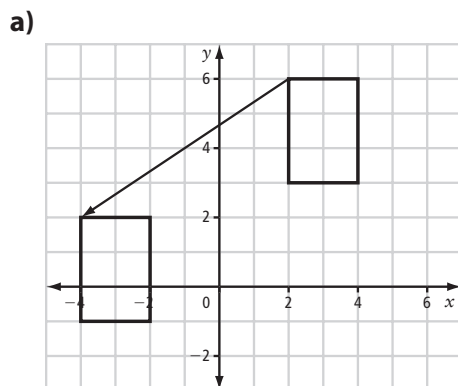
- a) Another word for slide is \_\_\_\_\_.
- b) A \_\_\_\_\_ can be clockwise or counterclockwise.
- c) A \_\_\_\_\_ is a mirror image.

2. Identify each transformation.

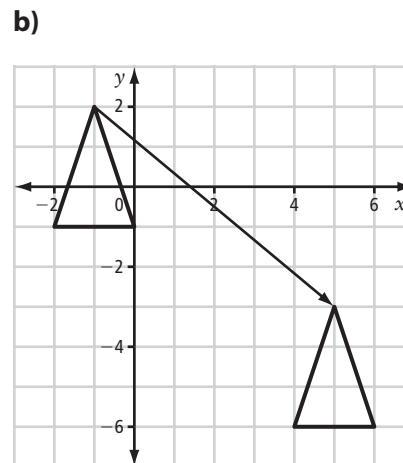


## Practise and Apply

3. What is the translation shown in each diagram?



Translation: \_\_\_\_\_

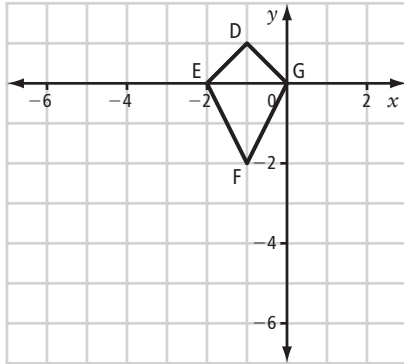


Translation: \_\_\_\_\_

Name: \_\_\_\_\_

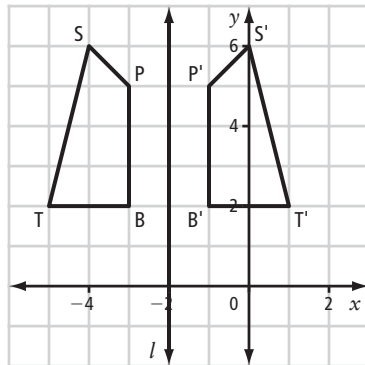
Date: \_\_\_\_\_

4. a) Translate figure DEFG 3 units left and 4 units down.



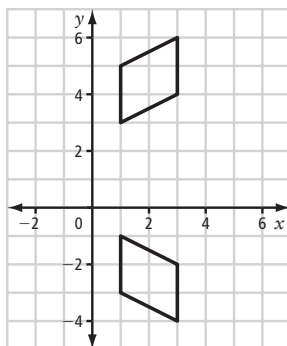
- b) Draw the translation arrow.  
c) Write the coordinates of the translation image on the grid.

5. a) Is figure  $S'P'B'T'$  a reflection image of figure  $SPBT$  in the line of reflection  $l$ ?  Yes  No

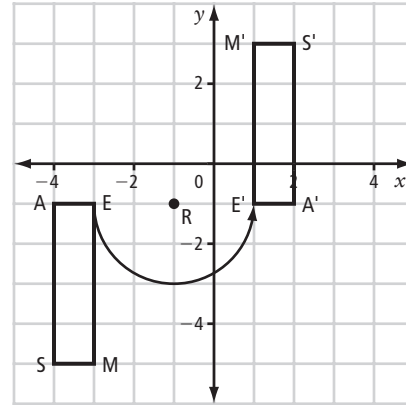


- b) How do you know?

6. Draw the line of reflection for the parallelogram.

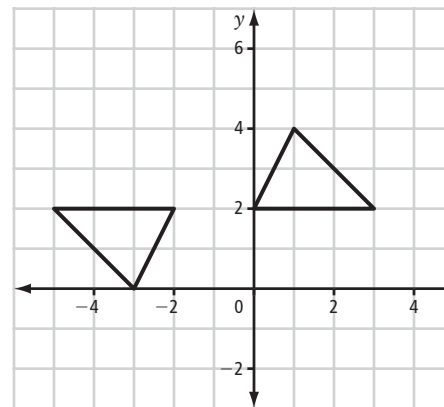


7. The diagram shows figure MSAE, its rotation image, and centre of rotation R.



- a) Label the coordinates of MSAE and  $M'S'A'E'$  on the grid.  
b) What are the direction and angle of rotation?

8. The diagram shows a triangle and its rotation image.



- a) Label the coordinates of the centre of rotation on the grid.  
b) What are the direction and angle of rotation? Give more than one answer, if possible.



Name: \_\_\_\_\_

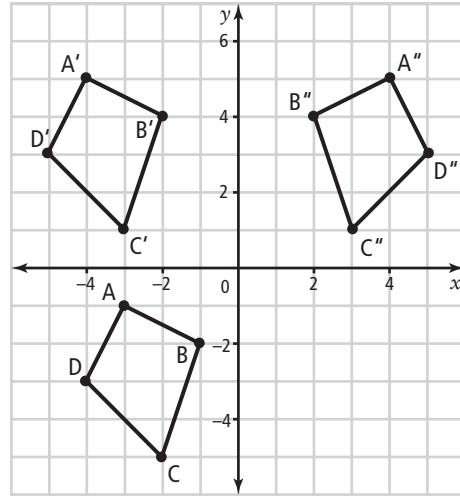
Date: \_\_\_\_\_

# 1.4 Horizontal and Vertical Distances

MathLinks 7, pages 30–35

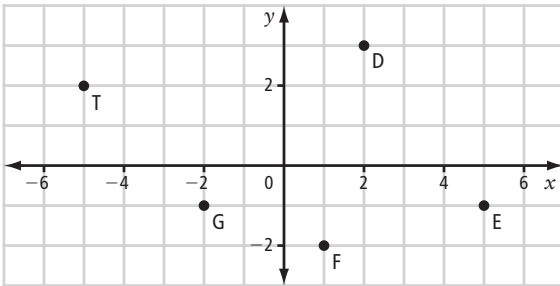
## Key Ideas Review

- Use the grid to complete each statement.
  - Movement from  $A'$  to  $A''$  is called \_\_\_\_\_ movement.
  - Movement from  $B$  to  $B'$  is called \_\_\_\_\_ movement.
  - After one transformation,  $D$  becomes \_\_\_\_\_.
  - After two transformations,  $D$  becomes \_\_\_\_\_.



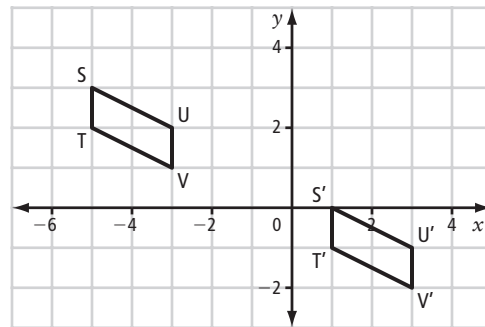
## Practise and Apply

- Describe the horizontal and vertical movements of point  $T$  to each of the following points.



- $D$  \_\_\_\_\_
- $E$  \_\_\_\_\_
- $F$  \_\_\_\_\_
- $G$  \_\_\_\_\_

- Parallelogram  $SUVT$  has been translated.

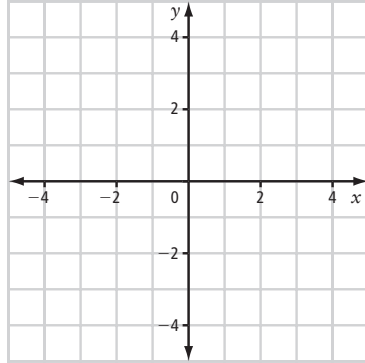


- Label the coordinates of  $S'U'V'T'$  on the grid.
- What are the horizontal and vertical movements of  $SUVT$  to  $S'U'V'T'$ ?

Name: \_\_\_\_\_

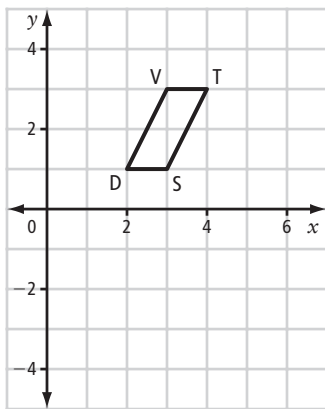
Date: \_\_\_\_\_

4. a) Draw a triangle with vertices  $C(-1, 1)$ ,  $D(-2, 4)$ , and  $E(-4, 1)$ . Reflect  $CDE$  over the  $y$ -axis. Reflect  $C'D'E'$  over the  $x$ -axis.



- b) Describe the horizontal and vertical change in position of  $C$  to  $C'$  to  $C''$ .
- c) Describe the movement of the vertices in the reflection over the  $x$ -axis.
- d) Label the coordinates of triangle  $C''D''E''$  on the grid.
- e) Compare the coordinates of  $C$  with  $C''$ . What do you notice?

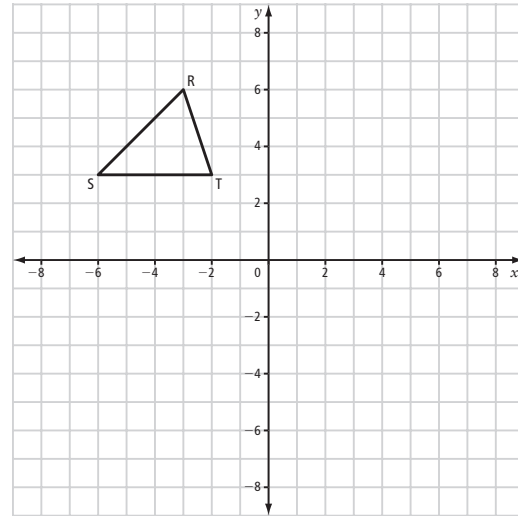
5.



- a) Translate vertex  $D$  1 unit left and 3 units down. Label this vertex  $D'$ .
- b) Translate vertex  $V$  6 units down. Label this vertex  $V'$ .

- c) Translate vertex  $T$  1 unit left and 7 units down. Label this vertex  $T'$ .
- d) Translate vertex  $S$  2 units left and 4 units down.
- e) Connect  $D'$  to  $V'$ ,  $V'$  to  $T'$ ,  $T'$  to  $S'$ , and  $S'$  to  $D'$ .
- f) What one transformation of the parallelogram  $DVTS$  would have given the same result?

6.



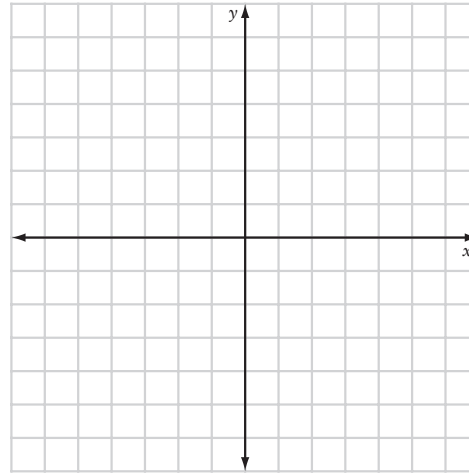
- a) Translate the triangle 1 unit horizontally left, and 4 units vertically down.
- b) Label the vertices of the translated triangle on the grid.
- c) Reflect  $RST$  over the  $y$ -axis and label the triangle  $R''S''T''$ .
- d) Label the vertices of the reflected triangle on the grid.
- e) Rotate  $RST$   $180^\circ$  about the centre of rotation  $(0, 0)$  and label this triangle  $R'''S'''T'''$ .
- f) Label the vertices of the rotated triangle on the grid.

Name: \_\_\_\_\_

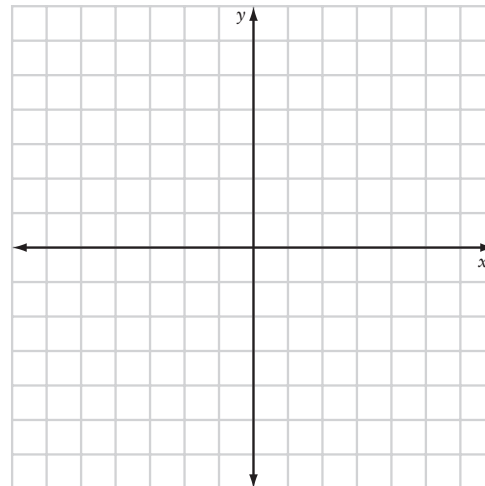
Date: \_\_\_\_\_

## Link It Together

1. a) Plot triangle PQR with vertices  $P(-5, -1)$ ,  $Q(-3, 2)$ , and  $R(-1, 0)$  on the coordinate grid.
- b) Translate the triangle 3 units horizontally right and 4 units vertically down. Label the new triangle  $P'Q'R'$ .
- c) Reflect triangle  $P'Q'R'$  in the  $x$ -axis to form triangle  $P''Q''R''$ .
- d) Label the coordinates of the vertices of triangle  $P''Q''R''$  on the grid.
- e) What are the horizontal and vertical movements from  $P$  to  $P''$ ,  $Q$  to  $Q''$ , and  $R$  to  $R''$ ?



2. a) In quadrant I, design the shape of the first initial of your name.
- b) Label the coordinates of the vertices on the grid.
- c) Describe a reflection that would move your initial to quadrant II. Draw the reflection image.
- d) Describe a rotation that would move your initial to quadrant III. Draw the rotation image.



- e) Describe a translation that would move your initial to quadrant IV. Draw the translation image.

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Vocabulary Link

Unscramble the letters of each word. Use the clues to help you solve the puzzles.

A	B
1. The four regions of a coordinate grid are referred to as _____.	SRTUDQANA
2. This transformation involves a slide along a straight line: _____.	STOTNAALRIN
3. The vertical line on a coordinate grid is called a(n) _____.	SX-IA Y
4. The _____ for the origin are (0, 0).	ROAENS DTCOI
5. The horizontal line on a coordinate grid is called a(n) _____.	-IXAXS
6. A(n) _____ is formed when a horizontal number line and a vertical number line cross.	TEACRNSIA NPLEA
7. This transformation involves a flip over a mirror line: _____.	FETINEOLRC
8. The x-axis and y-axis cross at the _____.	IRINGO
9. Translations, reflections, and rotations are all types of _____.	FITOROSNSAAMTNR
10. A(n) _____ is a turn around a fixed point.	AIORONTT
11. A(n) _____ is the point where two sides of a figure meet.	EEXVTR

