

6<sup>TH</sup> GRADE MATH

# Unit 4

## Relationships in the Coordinate Plane

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Date:

### Extra! Extra! Read all about it!

We are going to start Unit 4 (Relationships in the Coordinate Plane). Here is a list of IXL topics, for every topic you complete you will earn some extra credit. Here are the possible points you can earn on each topic. The extra credit will be due by \_\_\_\_\_.

#### Smart Score on IXL

- 100% - 5 extra points
- 95% - 4 extra points
- 90% - 3 extra points
- 85% - 2 extra points
- 80% - 1 extra point

#### Unit 4 Topics – You can earn up to 90 extra credit points. You got this 🍀

(REVIEW) → 5.G.A.1 Graph ordered pairs and label points using the first quadrant of the coordinate plane. Understand in the ordered pair that the first number indicates the horizontal distance traveled along the x-axis from the origin and the second number indicates the vertical distance traveled along the y-axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).

1. Describe the coordinate plane (5-U.)
2. Objects on a coordinate plane (5-U.1)

(REVIEW) → 5.G.A.2 Represent real-world and mathematical problems by graphing points in the first quadrant of the coordinate plane and interpret coordinate values of points in the context of the situation.

3. Graph points on a coordinate plane (5-U.2)
4. Graph points from a table (5-U.)
5. Coordinate planes as maps (5-U.3)
6. Follow directions on a coordinate plane (5-U.4)

(REVIEW) → 5.OA.B.3.a Identify relationships between corresponding terms in two numerical patterns.

7. Compare patterns (5-T.2)
8. Write a two-variable equation (5-V.11)

6.NS.C.6.b Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.

9. Quadrants (6-X.3)

6.NS.C.6.c Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.

10. Decimal number lines (6-F.8)
11. Integers on number lines (6-M.2)
12. Graph integers on horizontal and vertical number lines (6-M.3)
13. Rational numbers on number lines (6-P.)
14. Objects on a coordinate plane (6-X.1)
15. Graph points on a coordinate plane (6-X.2)

6.NS.C.8 Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.

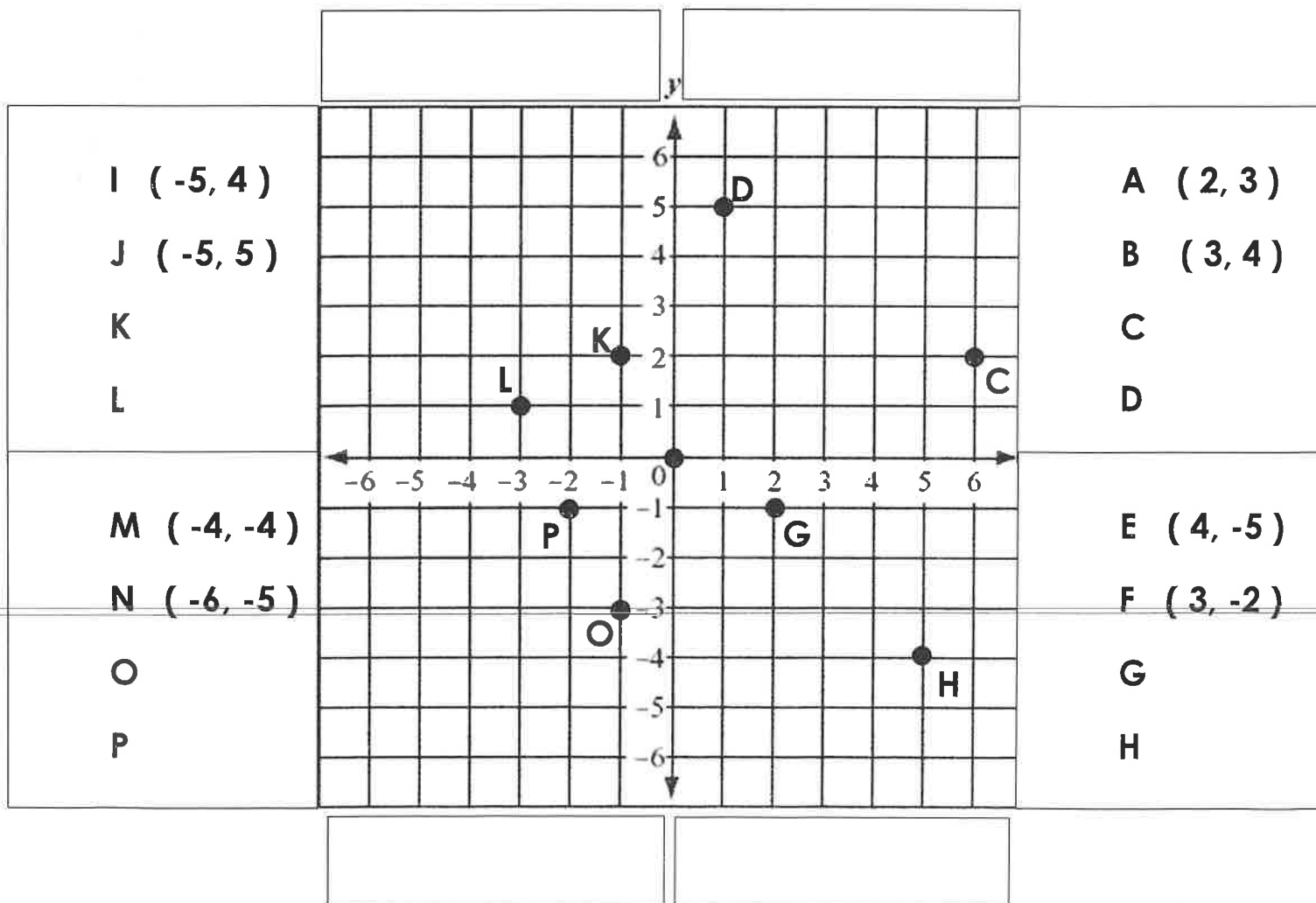
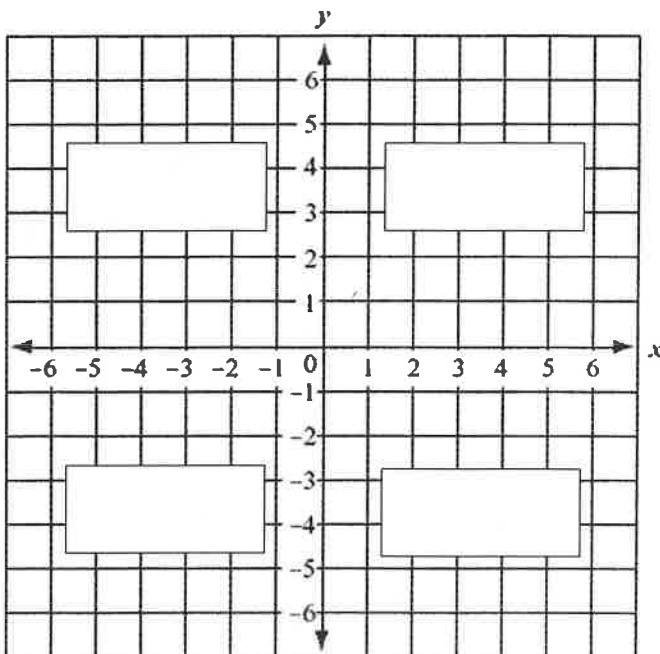
16. Coordinate planes as maps (6-X.4)
17. Distance between two points (6-X.5)
18. Follow directions on a coordinate plane (6-X.6)

# Coordinate Planes

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

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

**Daily Target:** I can use my knowledge of the different quadrants to plot a point on the coordinate plane.



## Locating Coordinates in the First Quadrant

**Learning Outcome:** To locate coordinates in the first quadrant.

What is at point  $(10, 6)$ ? \_\_\_\_\_

What is at point  $(1, 5)$ ? \_\_\_\_\_

What is at point  $(3, 10)$ ? \_\_\_\_\_

What is at point  $(4, 2)$ ? \_\_\_\_\_

What is at point  $(9, 9)$ ? \_\_\_\_\_

What is at point  $(5, 8)$ ? \_\_\_\_\_

What is at point  $(1, 8)$ ? \_\_\_\_\_

What is at point  $(5, 5)$ ? \_\_\_\_\_

What is at point  $(7, 9)$ ? \_\_\_\_\_

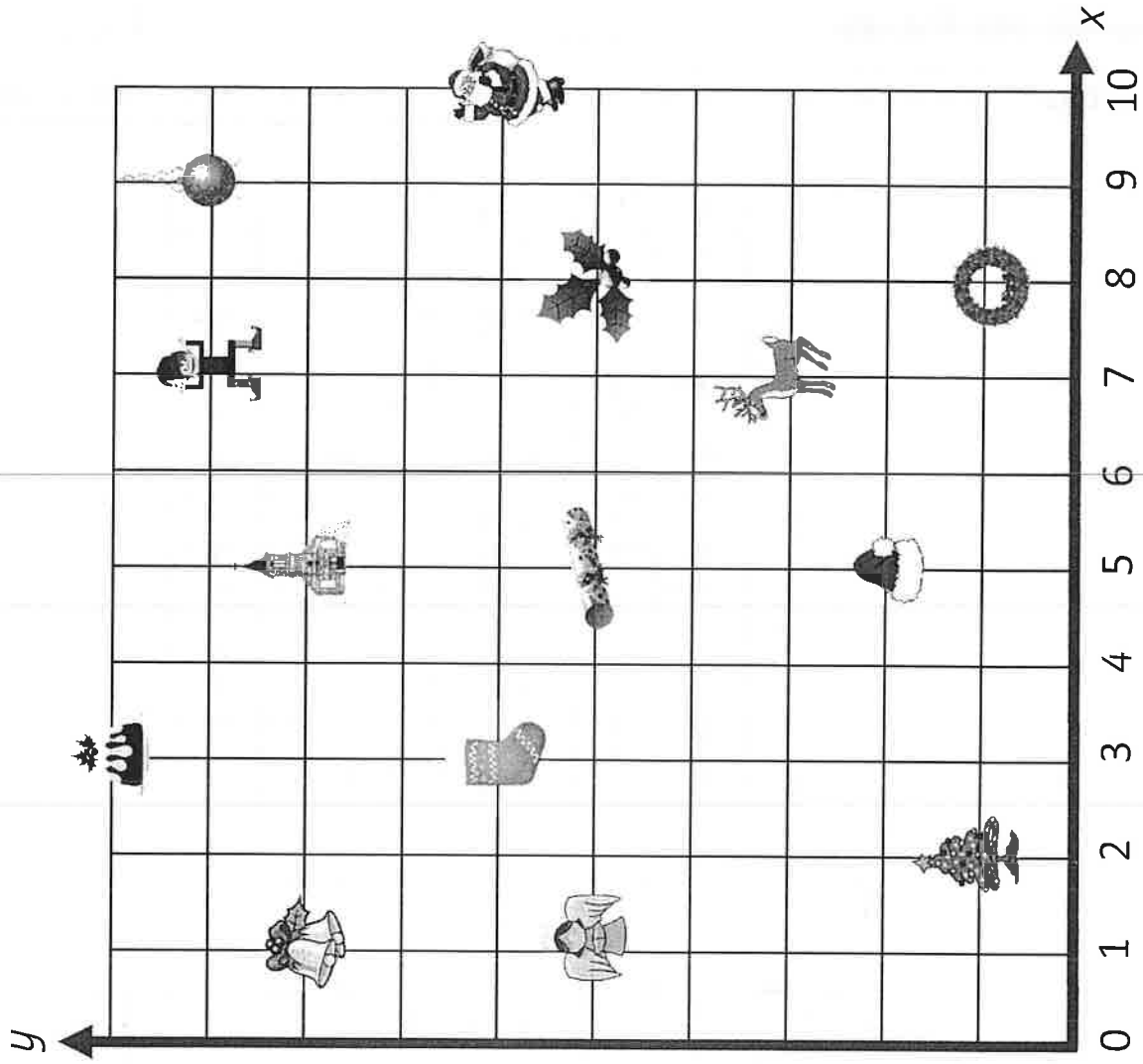
What is at point  $(5, 2)$ ? \_\_\_\_\_

What is at point  $(2, 1)$ ? \_\_\_\_\_

What is at point  $(7, 3)$ ? \_\_\_\_\_

What is at point  $(3, 6)$ ? \_\_\_\_\_

What is at point  $(8, 1)$ ? \_\_\_\_\_



## Finding Distance of Points

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

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

**Daily Target:** I can find the distance between two points with and without a coordinate plane.

### Without a Coordinate Plane

**If they are in different quadrants:**

**Step One:**

Determine which \_\_\_\_\_ is the same (x or y) and cross it out.

**Step Two:**

\_\_\_\_\_ the number that is different in both coordinate \_\_\_\_\_.

**Step Three:**

Find the \_\_\_\_\_ value of each number (write an expression)

**Step Four:**

Find the \_\_\_\_\_.

*Find the distance between:*

(12, -3)    (-7, -3)

(-2, -6)    (-2, 1)

**If they are in the same quadrant:**

**Step One:**

\_\_\_\_\_ which coordinate is the same (x or y) and \_\_\_\_\_ it out.

**Step Two:**

Circle the number that is \_\_\_\_\_ in both coordinate pairs.

**Step Three:**

Write a \_\_\_\_\_ expression.

**Step Four:**

Find the \_\_\_\_\_.

*Find the distance between:*

(12, -3)    (7, -3)

(5, 9)    (5, 4)

# Finding Distance of Points

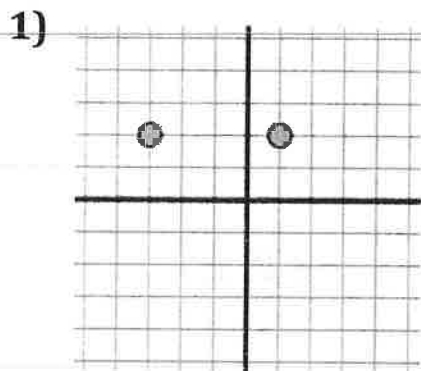
Name: \_\_\_\_\_

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

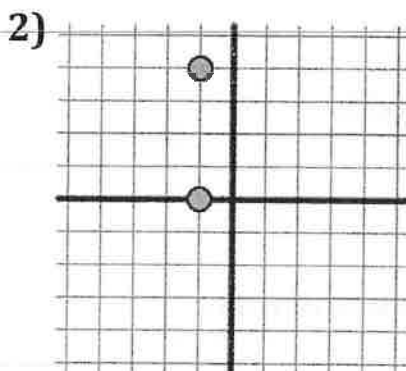
**Daily Target:** I can find the distance between two points with and without a coordinate plane.

*\*When finding the distance between two points on a graph, simply count how many spaces are between the two points.*

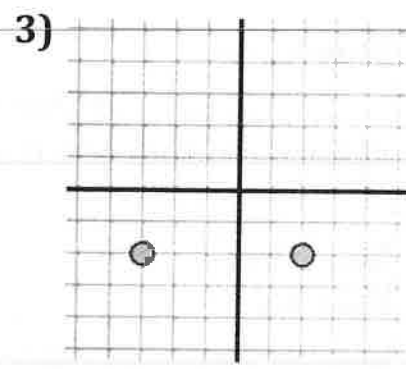
**Find the distance between the two points:**



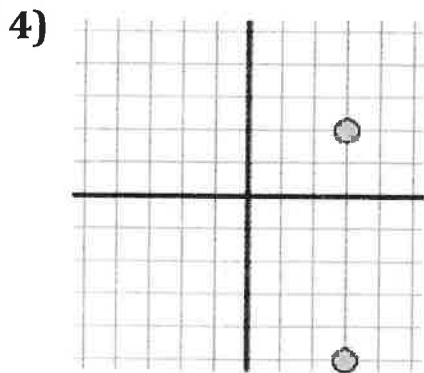
Distance: \_\_\_\_\_



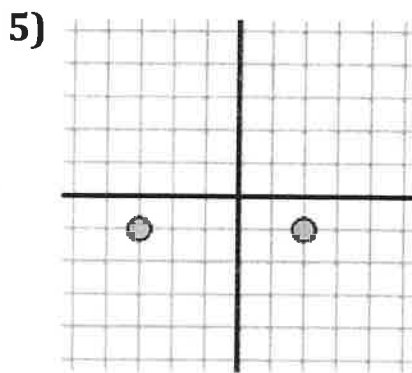
Distance: \_\_\_\_\_



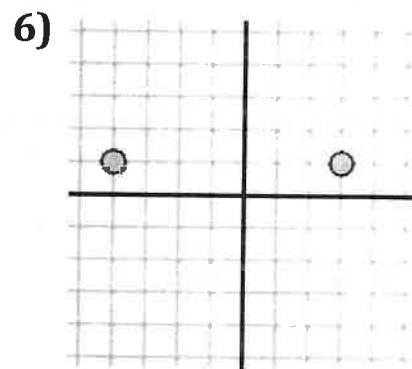
Distance: \_\_\_\_\_



Distance: \_\_\_\_\_



Distance: \_\_\_\_\_



Distance: \_\_\_\_\_

**Find the distance between the two points:**

1)  $(9, 8)$   $(9, 1)$

2)  $(-1, 2)$   $(-1, -3)$

3)  $(-3, 12)$   $(-3, 5)$

Distance: \_\_\_\_\_

Distance: \_\_\_\_\_

Distance: \_\_\_\_\_

## Reflecting over X&Y Axis

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

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

**Daily Target:** I can reflect a point or figure over the x and y axis.

### Step One:

\_\_\_\_\_ all of the key features of a coordinate graph (origin, \_\_\_\_\_, quadrants, integers)

### Step Two:

If necessary, \_\_\_\_\_ the initial point by \_\_\_\_\_ the x-axis first, then the y-axis.

### Step Three:

\_\_\_\_\_ the distance in units, from the point to the axis you are going to \_\_\_\_\_ over. Put your finger at that point on the \_\_\_\_\_.

### Step Four:

From your finger, \_\_\_\_\_ the exact same number of units in the \_\_\_\_\_ direction.

### Step Five:

Label the \_\_\_\_\_ point with the coordinate pair or \_\_\_\_\_ label given the directions (i.e. plot point A)

### Reflection across the x-axis:

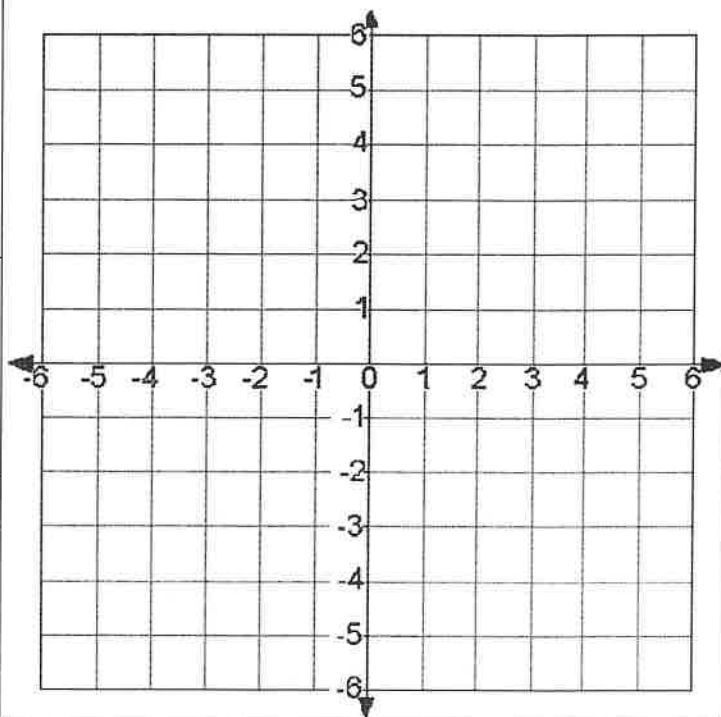
$$T(3, 2) \rightarrow T'(\quad, \quad)$$

$$R(-4, 5) \rightarrow R'(\quad, \quad)$$

### Reflection across the y-axis:

$$H(1, 3) \rightarrow H'(\quad, \quad)$$

$$B(2, -1) \rightarrow B'(\quad, \quad)$$



### Reflecting without a graph:

1) What do you notice happens when you reflect across the x-axis?

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✓ 2) What do you notice happens when you reflect across the y-axis?

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# Reflecting over X&Y Axis

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

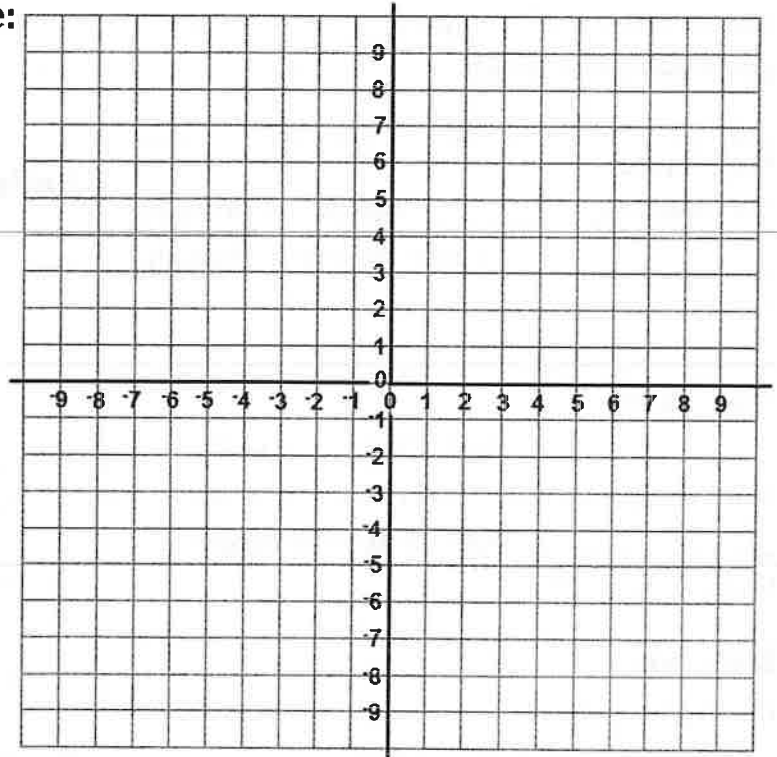
Date: \_\_\_\_\_

**Daily Target:** I can reflect a point or figure over the x and y axis.

## Practice!

### Reflecting with a Coordinate Plane:

- 1) Label the X & Y axis.
- 2) Label Suzy's house at point  $(-9, -2)$ .
- 3) Label the park as the reflection of Suzy's house over the x and y axis.
- 4) Label the school at point C  $(-6, 2)$
- 5) What quadrant is Suzy's house in?  
→ Quadrant \_\_\_\_\_



### Reflecting without a Coordinate Plane:

Find the coordinates of the vertices of each figure after the given transformation.

#### Reflection across the x-axis

$$G(-3, -1) \rightarrow G' ( \quad )$$

$$M(-2, 0) \rightarrow M' ( \quad )$$

$$K(0, -4) \rightarrow K' ( \quad )$$

$$F(-5, -4) \rightarrow F' ( \quad )$$

#### Reflection across the y-axis

$$V(3, -4) \rightarrow V' ( \quad )$$

$$E(2, -1) \rightarrow E' ( \quad )$$

$$M(6, -3) \rightarrow M' ( \quad )$$

$$B(1, 3) \rightarrow B' ( \quad )$$



# Graphing Polygons

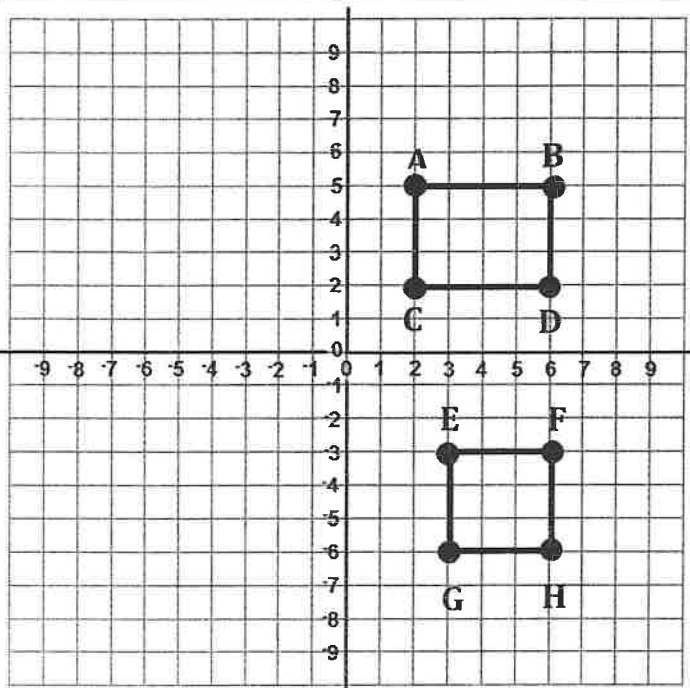
Name: \_\_\_\_\_

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

**Daily Target:** I can identify the points used to graph polygons on a coordinate plane.

## Graphing Polygons

\_\_\_\_\_ planes can help solve \_\_\_\_\_ with polygons by graphing their \_\_\_\_\_.



**What are the points for each polygon?**

Rectangle:

A (       )

B (       )

C (       )

D (       )

Square:

E (       )

F (       )

G (       )

H (       )

**What do you notice about the x-coordinates for points A&C and B&D?**

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**What do you notice about the y-coordinates for points A&B and C&D?**

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# Graphing Polygons

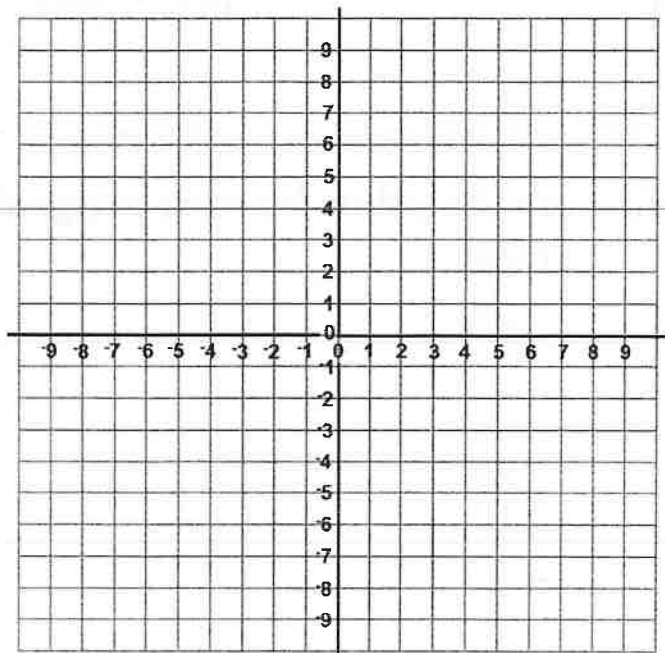
Name: \_\_\_\_\_

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

**Daily Target:** I can identify the points used to graph polygons on a coordinate plane.

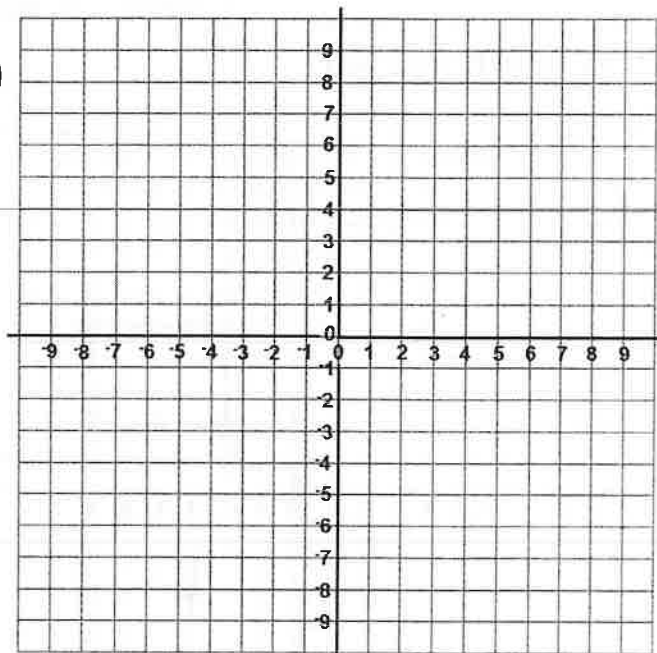
**Graph the coordinates to make the correct polygon.**

1)



- A (-4, 9)      C (-1, 9)  
B (-4, 5)      D (-1, 5)

2)

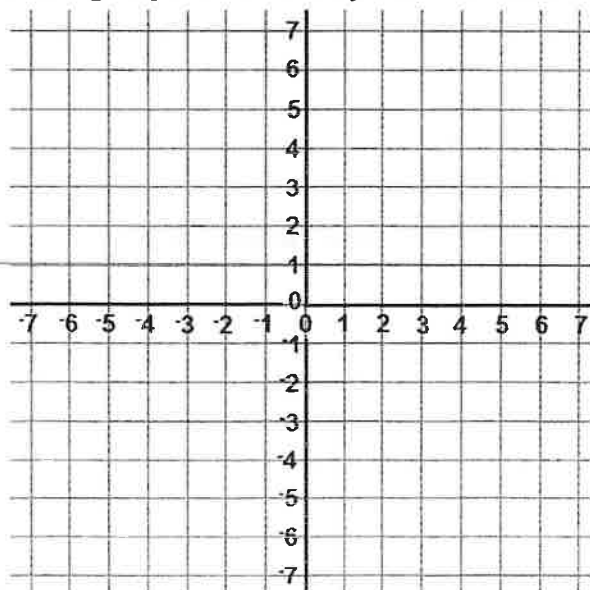


- W (0, -2)      Y (4, 6)  
X (4, -2)      Z (0, 6)

*Find the missing coordinate:*

3) On a town map, a block is a square with three of its vertices at A(-1, 3), B(3, 3), and C(3, 6). What are the coordinates of the remaining vertex, D?

*Use the graph below to find the missing coordinate:*



*Missing vertex:*

→ D (      ,      )

# Coordinate Grid Paper

## Task

The vertices of eight polygons are given below. For each polygon:

Plot the points in the coordinate plane connect the points in the order that they are listed.

Color the shape the indicated color and find the estimated area.

a. The first polygon is GREY and has these vertices:

$(-7, 4)$   $(-8, 5)$   $(-8, 6)$   $(-7, 7)$   $(-5, 7)$   $(-5, 5)$   $(-7, 4)$

b. The second polygon is ORANGE and has these vertices:

$(-2, -7)$   $(-1, -4)$   $(3, -1)$   $(6, -7)$   $(-2, -7)$

c. The third polygon is GREEN and has these vertices:

$(4, 3)$   $(3, 3)$   $(2, 2)$   $(2, 1)$   $(3, 0)$   $(4, 0)$   $(5, 1)$   $(5, 2)$   $(4, 3)$

d. The fourth polygon is BROWN and has these vertices:

$(0, -10)$   $(0, -8)$   $(7, -10)$   $(0, -10)$

e. The fifth polygon is PURPLE and has these vertices:

$(-8, -5)$   $(-8, -8)$   $(-5, -8)$   $(-5, -5)$   $(-8, -5)$

f. The sixth polygon is PINK and has these vertices:

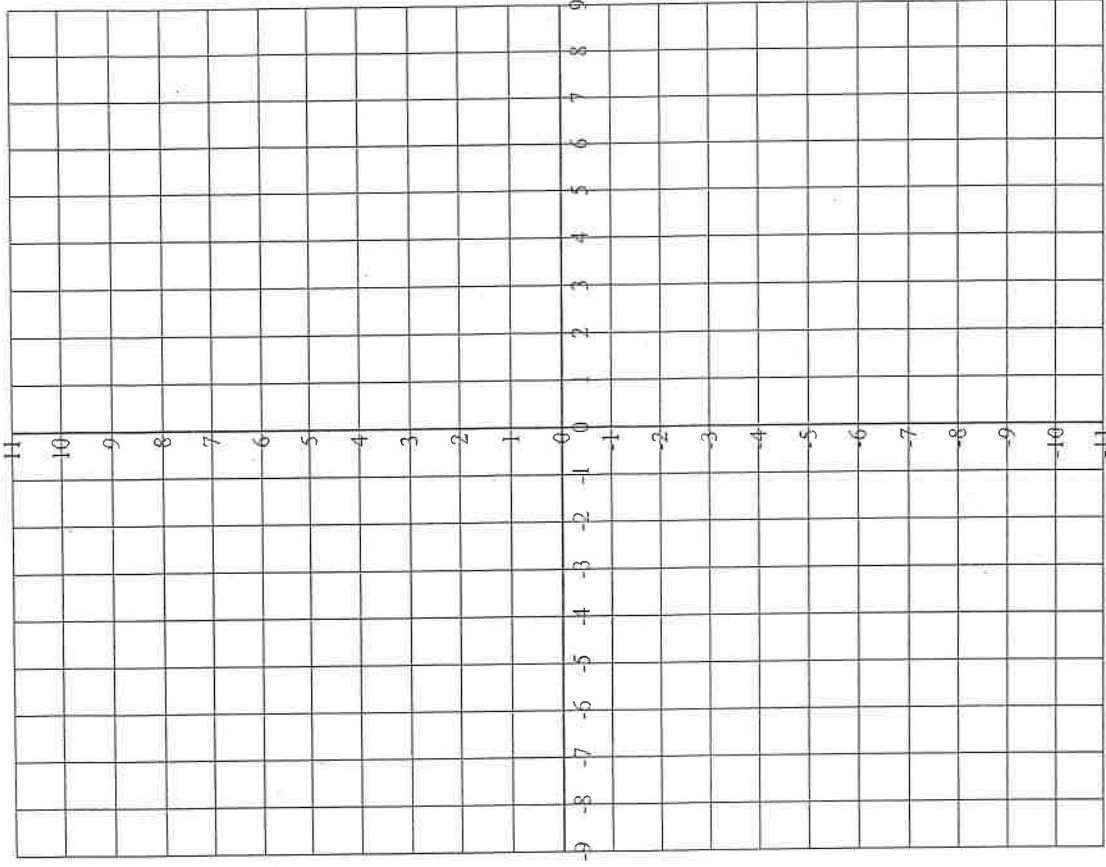
$(9, -1)$   $(6, 1)$   $(6, -3)$   $(9, -1)$

g. The seventh polygon is BLUE and has these vertices:

$(-6, -4)$   $(-6, 1)$   $(-9, 1)$   $(-9, -4)$   $(-6, -4)$

h. The eighth polygon is YELLOW and has these vertices:

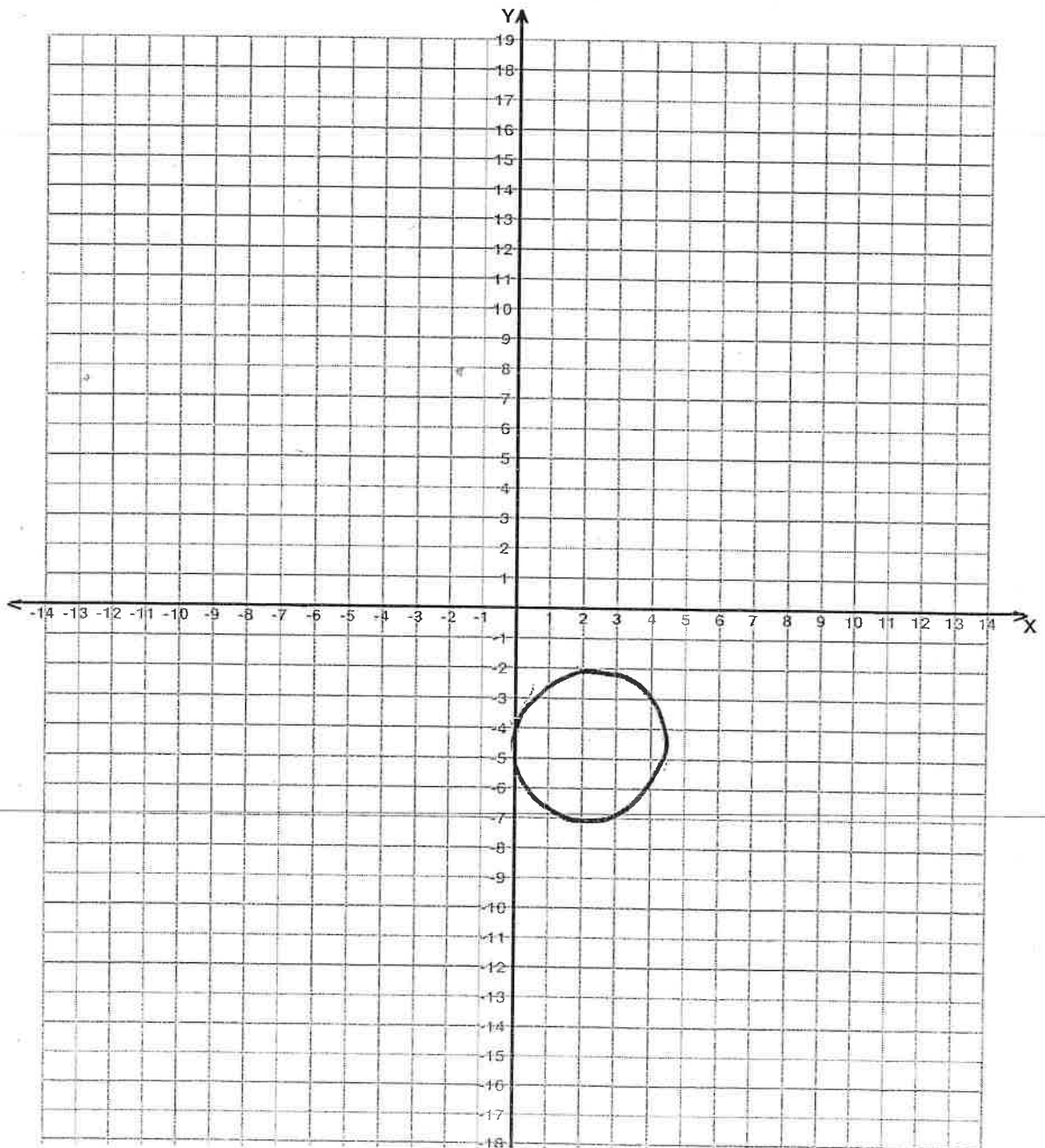
$(-5, 1)$   $(-3, -3)$   $(-1, -2)$   $(0, 3)$   $(-3, 3)$   $(-5, 1)$

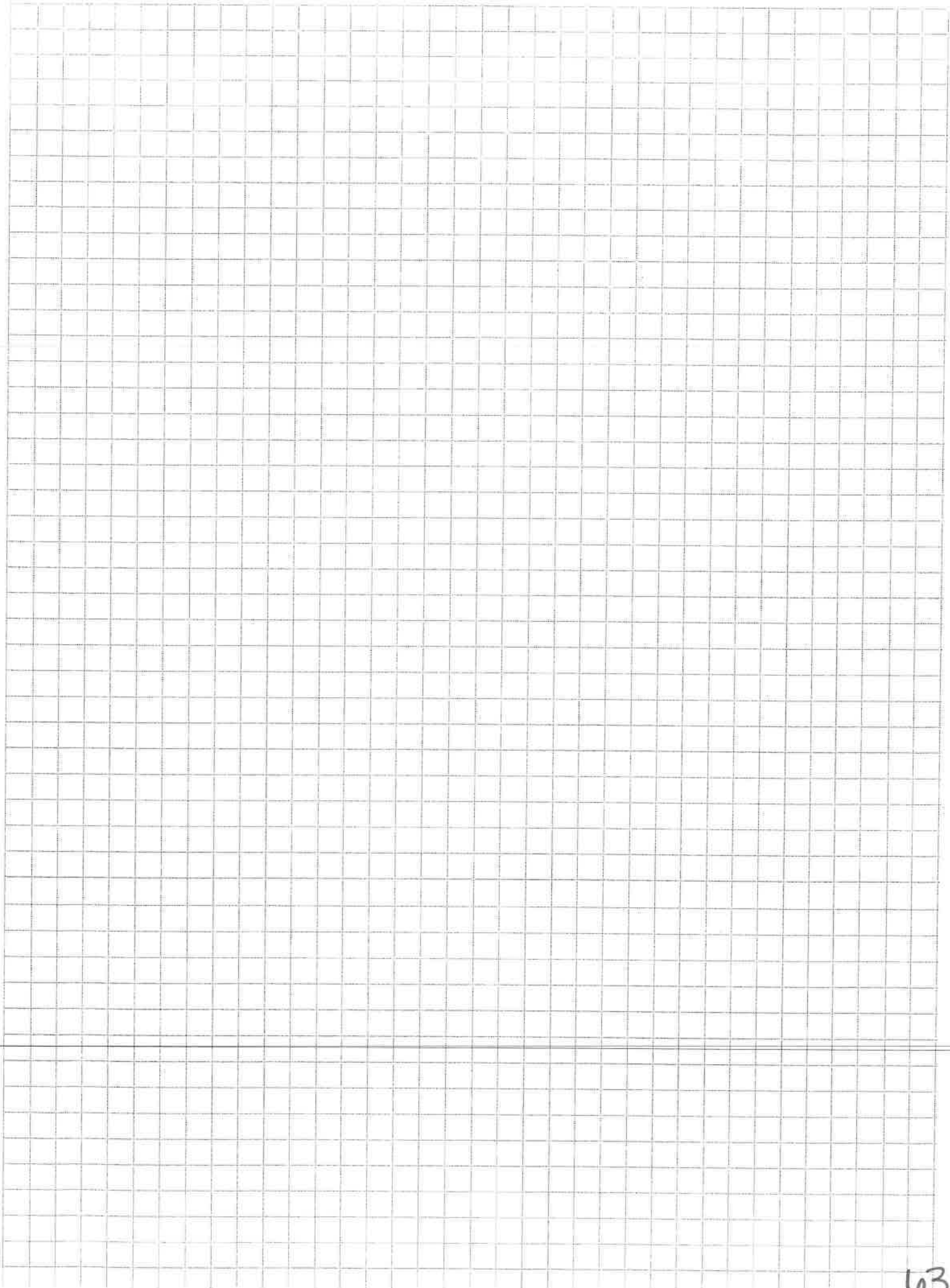


## Football Fun

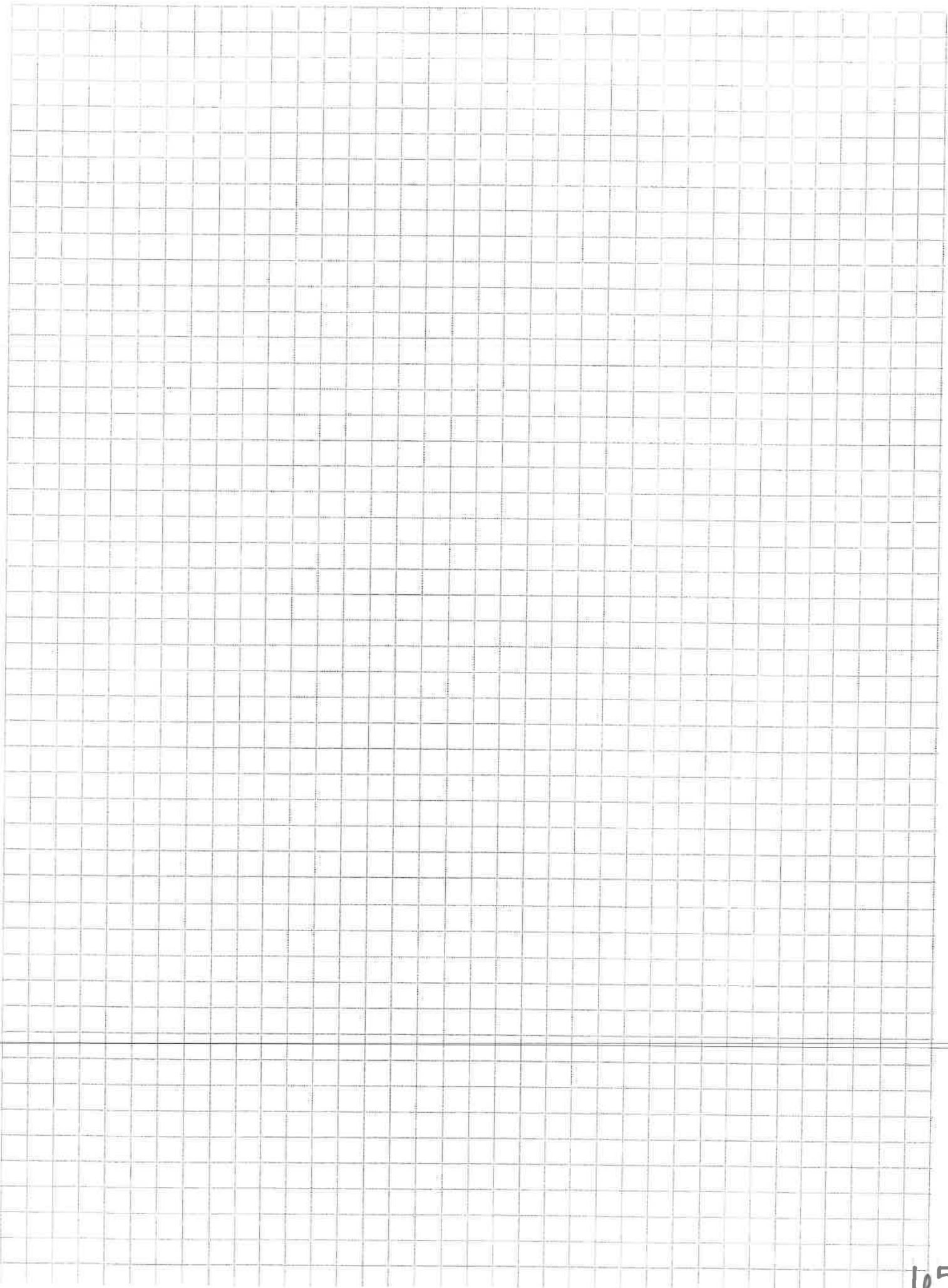
Plot the ordered pairs. Connect the points to make a picture. Color and decorate the picture to match your chosen team.

1. (4, 12)	2. (9, 9)	3. (12, 4)	4. (12, -3)
5. (10, -9)	6. (9, -10)	7. (7, -9)	8. (2, -11)
9. (-1, -11)	10. (-3, -10)	11. (-4, -8)	12. (-11, -10)
13. (-12, -9)	14. (-11, -8)	15. (-11, -6)	16. (-12, -5)
17. (-11, -4)	18. (-4, -6)	19. (-3, -3)	20. (-4, 0)
21. (-8, 2)	22. (-8, 3)	23. (-5, 8)	24. (-1, 11)
25. (4, 12)	26. <b>STOP</b>	27. (-5, -7)	28. (-10, -8)
29. (-10, -6)	30. (-5, -7)	31. <b>STOP</b>	<b>Color</b>



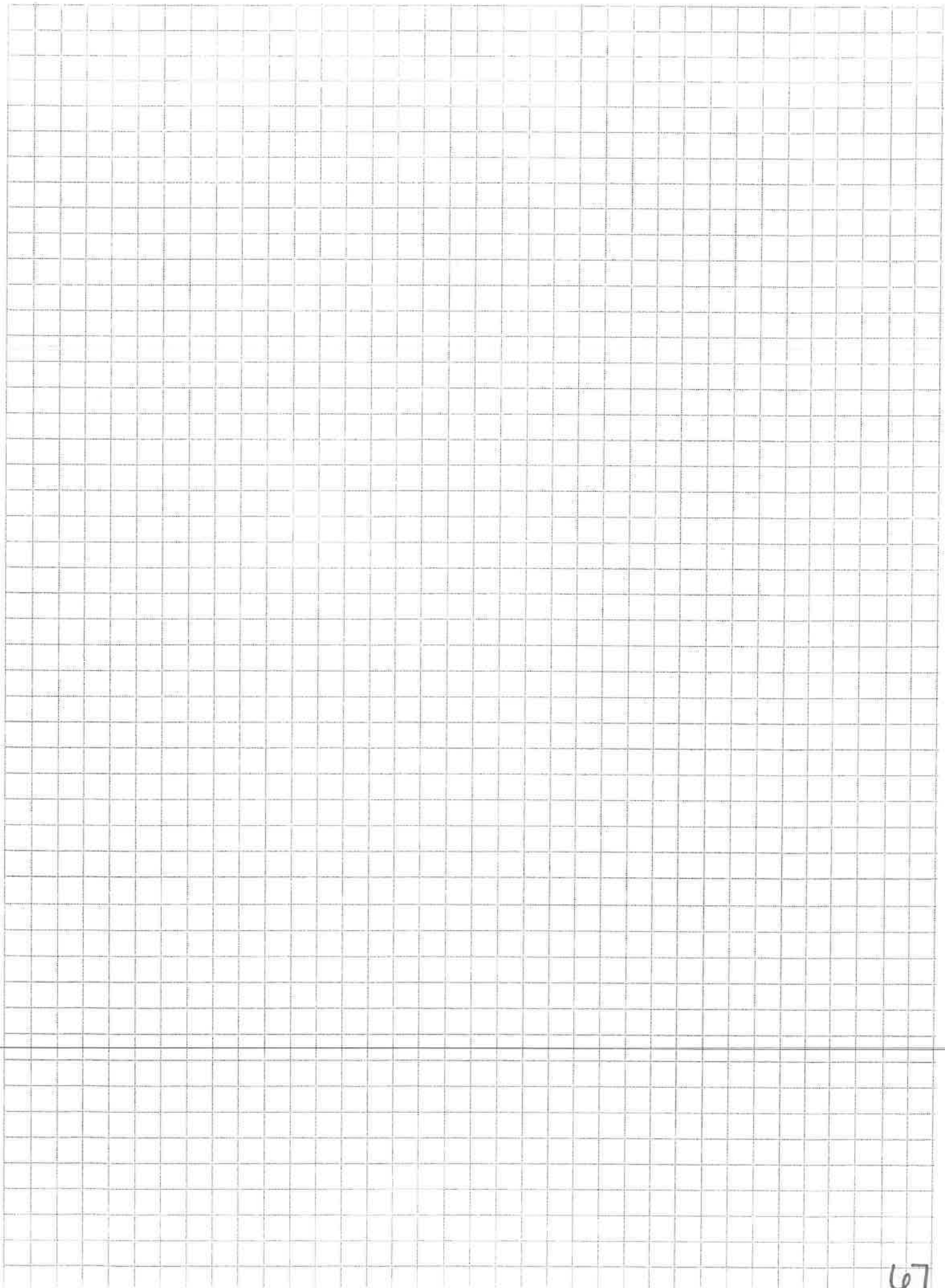
















# ADDITIONAL NOTES

Handwriting practice lines consisting of 25 horizontal lines spaced evenly down the page.