

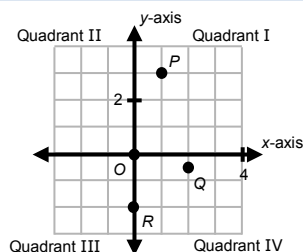
Packet 15: Graphing in the Coordinate Plane

Dear Parents/Guardians,

Packet 15 introduces graphing in the coordinate plane. Students graph rational coordinates on the plane. They plot the vertices of polygons and determine the perimeter and area of each. They use their knowledge of drawing polygons on the plane to draw reflected images.

Graphing Points

A coordinate plane is determined by a horizontal number line (called the x-axis) and a vertical number line (called the y-axis), intersecting at the origin (0,0). There are four quadrants within the coordinate plane to help locate points.



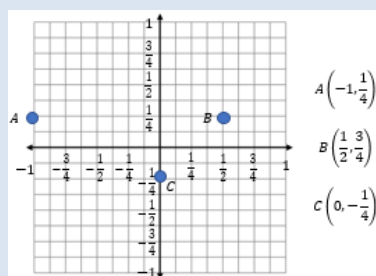
Points are located using ordered pairs (x,y).

O (0,0), located at the origin

P (1,3), located in Quadrant I (QI)

Q (2, $-\frac{1}{2}$), located in Quadrant IV (QIV)

R (0,-2), located on the y-axis



Students scale coordinate graphs appropriately, based on the given coordinates.

A $(-1, \frac{1}{4})$

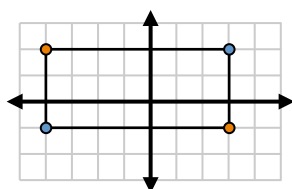
B $(\frac{1}{2}, \frac{3}{4})$

C $(0, -\frac{1}{4})$

Polygons in the Coordinate Plane

Students graph polygons in the coordinate plane. They also determine the missing vertices to create polygons.

Example: The endpoints of one diagonal of a rectangle are (3,2) and (-4,1).



(3, -1) and (-4, -2) are the other two endpoints for the rectangle (in orange).

Students determine the length and width to find the perimeter and area of polygons.

$$P = 2l + 2w$$

$$A = lw$$

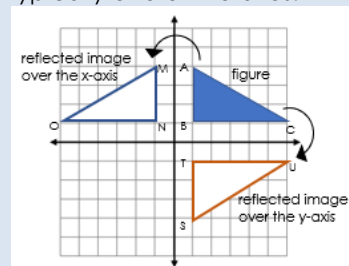
$$P = 2(3) + 2(7)$$

$$A = 3(7) = 21 \text{ units}^2$$

$$P = 6 + 14 = 20 \text{ units}$$

Reflections

A reflection is a 'flip' of an image around a given line (called the line of symmetry). In grade 6, the line of symmetry is typically one of the axes.



Notice the images are mirror images of the original figure around each axis.

Reflected images are:

→ The same distance (but on the opposite side) from the axis it is reflected on.

→ Reversed in orientation from the original figure.

Students graph figures and their reflections, noting the change in coordinates for the vertices of the image that correlate to the original figure.

$\triangle ABC$	$\triangle STU$	$\triangle MNO$
A(1,4)	S(1,-4)	M(-1,1)
B(1,1)	T(1,-1)	N(-1,1)
C(6,1)	U(6,-1)	O(-6,1)



By the end of the packet, your student should know...

How to graph ordered pairs
Lessons 15.1 and 15.2

How to draw polygons in the plane given the coordinates of the vertices
Lessons 15.1 and 15.2

How to find lengths of horizontal and vertical line segments in the coordinate plane
Lessons 15.1 and 15.2

How to graph figures and their reflected images across a coordinate axis
Lesson 15.3

Additional Resources

Resource Guide (RG)
Part 2, pages 45-46