

Lesson 16: Symmetry in the Coordinate Plane

Classwork

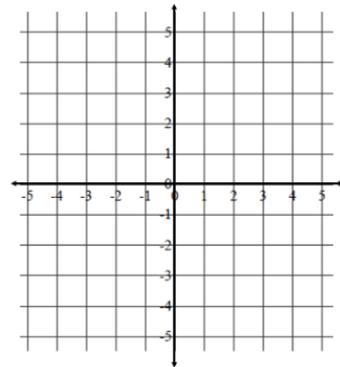
Opening Exercise

Give an example of two opposite numbers, and describe where the numbers lie on the number line. How are opposite numbers similar, and how are they different?

Example 1: Extending Opposite Numbers to the Coordinate Plane

Extending Opposite Numbers to the Coordinates of Points on the Coordinate Plane

Locate and label your points on the coordinate plane to the right. For each given pair of points in the table below, record your observations and conjectures in the appropriate cell. Pay attention to the absolute values of the coordinates and where the points lie in reference to each axis.



| | $(3, 4)$ and $(-3, 4)$ | $(3, 4)$ and $(3, -4)$ | $(3, 4)$ and $(-3, -4)$ |
|-----------------------------|------------------------|------------------------|-------------------------|
| Similarities of Coordinates | | | |
| Differences of Coordinates | | | |

| | | | |
|---|--|--|--|
| Similarities in Location | | | |
| Differences in Location | | | |
| Relationship Between Coordinates and Location on the Plane | | | |

Exercises

In each column, write the coordinates of the points that are related to the given point by the criteria listed in the first column of the table. Point $S(5,3)$ has been reflected over the x - and y -axes for you as a guide, and its images are shown on the coordinate plane. Use the coordinate grid to help you locate each point and its corresponding coordinates.

| Given Point: | $S(5, 3)$ | $(-2, 4)$ | $(3, -2)$ | $(-1, -5)$ |
|--|-----------|-----------|-----------|------------|
| The given point is reflected across the x -axis. | | | | |
| The given point is reflected across the y -axis. | | | | |
| The given point is reflected first across the x -axis and then across the y -axis. | | | | |
| The given point is reflected first across the y -axis and then across the x -axis. | | | | |

1. When the coordinates of two points are (x, y) and $(-x, y)$, what line of symmetry do the points share? Explain.
2. When the coordinates of two points are (x, y) and $(x, -y)$, what line of symmetry do the points share? Explain.

Examples 2–3: Navigating the Coordinate Plane