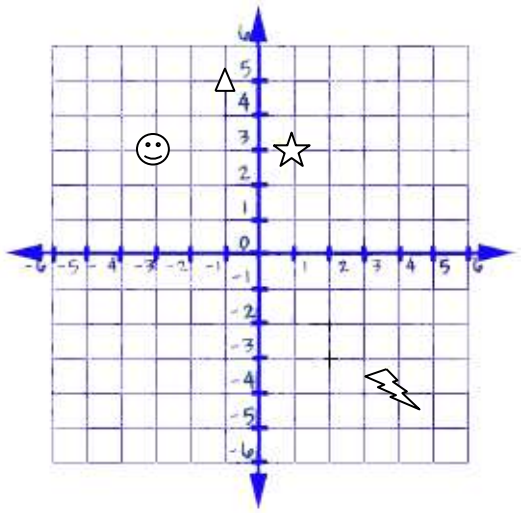
Learning Task: Graphing on the Coordinate Plane



1. The points (1, 3), (-1, 5), (-3, 3), and (4, -4) have been graphed on the coordinate plane. Reflect each point across the *x*-axis. What are the coordinates of the reflected points?

When the star (1, 3) is reflected across the *x*-axis, the new point is located at _____.

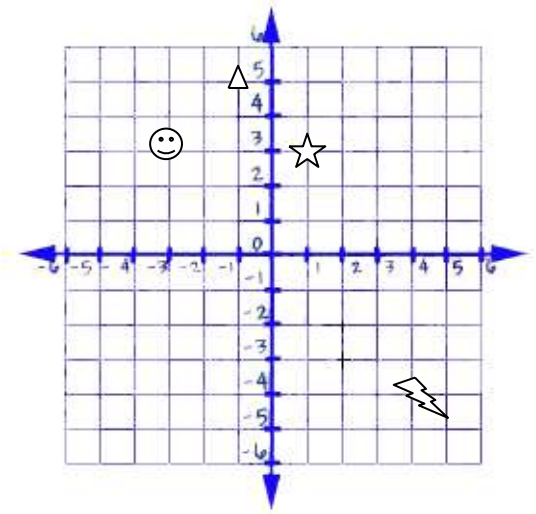
When the triangle (-1, 5) is reflected across the *x*-axis, the new point is located at _____.

When the smiley face (-3, 3) is reflected across the *x*-axis, the new point is located at _____.

When the lightning bolt (4, -4) is reflected across the *x*-axis, the new point is located at _____.

What similarities do you notice between the coordinates of the original point and the reflected point?

2. The points (1, 3), (-1, 5), (-3, 3), and (4, -4) have been graphed on the coordinate plane. Reflect each point across the *y*-axis. What are the coordinates of the reflected points?



When the star (1, 3) is reflected across the *y*-axis, the new point is located at _____.

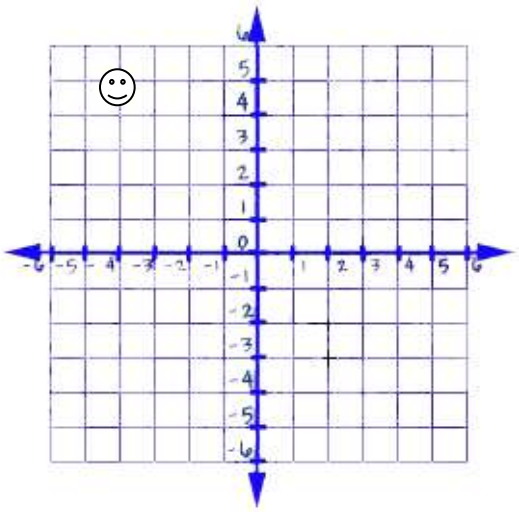
When the triangle (-1, 5) is reflected across the *y*-axis, the new point is located at _____.

When the smiley face (-3, 3) is reflected across the *y*-axis, the new point is located at _____.

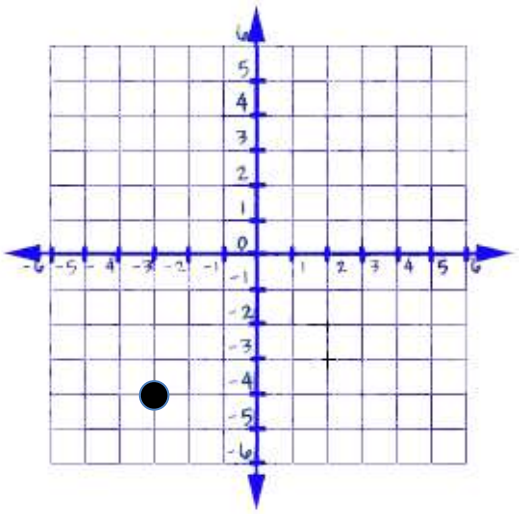
When the lightning bolt (4, -4) is reflected across the *y* -axis, the new point is located at _____.

What similarities do you notice between the coordinates of the original point and the reflected point?'

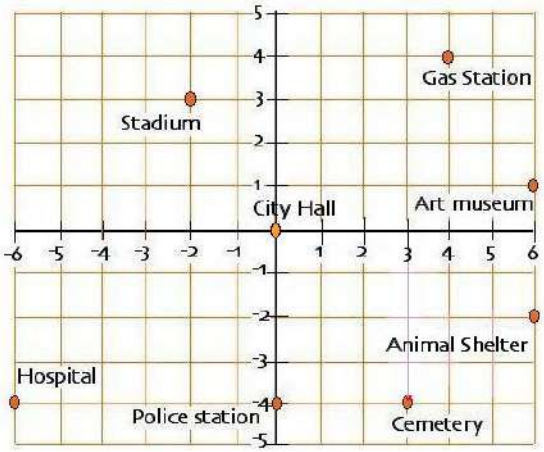
3. The smiley face, located at point (-4, 5), has been reflected across the *y*-axis**.** The new location of the smiley face is (4, 5). What is the distance between (-4, 5) and (4, 5)? Write a number sentence using the distance from the *y*-axis to help justify your answer.



4. A point, located at (-3, -4), has been reflected across the *x*-axis. The new point has the coordinates (-3, 4). What is the distance between (-3, -4) and (-3, 4)? Write a number sentence using the distance from the *x*-axis to help justify your answer.



Use the drawing of the city to help you answer questions 5-11.



5. What is the location of city hall? What is the location of the police station? How many blocks apart are these two buildings?

6. What is the location of the art museum? What is the location of the animal shelter? How many blocks apart are these two buildings?

7. What is the location of the hospital? What is the location of the cemetery? How many blocks apart are these two buildings?

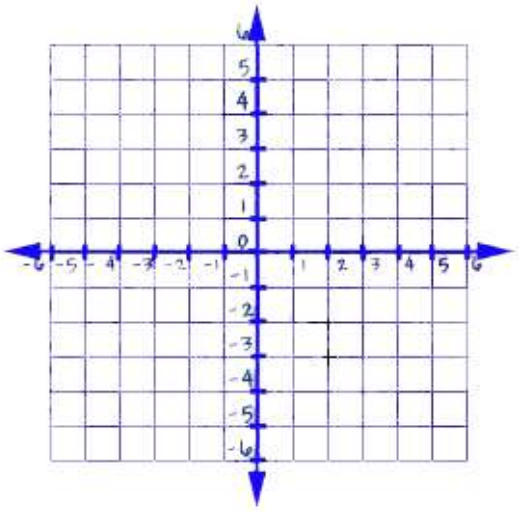
8. What is the location of the hospital? What is the location of the police station? How many blocks apart are these two buildings?

9. The police station is being moved to its new location located at (-6, -1). Is the police station closer to, farther away from, or the same distance from the Hospital?

10. The art museum and the animal shelter are moving as well. Their movement can be described as a reflection across the *y*-axis. What are the coordinates of the new location for the art museum and the animal shelter? How many blocks are they from each other? Is this the same distance as in question 12? Why or why not?

11. The stadium is also being moved. Its new location can be described as a reflection across the *x*-axis. What is the new location of the stadium? How many blocks is the new stadium from the old stadium?

12. On a map, the library is located at (-2, 2), the city hall is located at (0, 2), and the middle school is located at (0, 0).

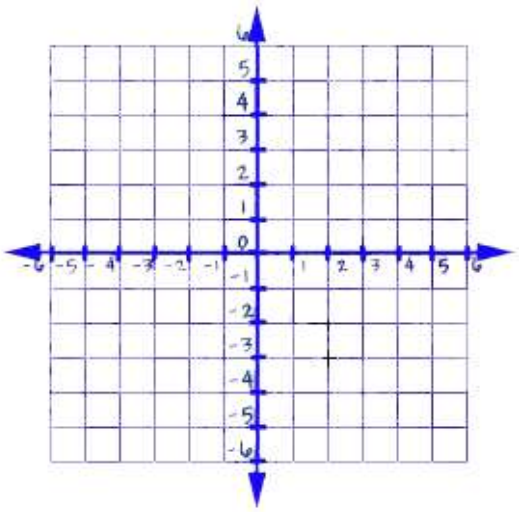


A. Represent the locations as points on a coordinate grid with a unit of 1 mile.

B. What shape is formed by connecting the three locations?

C. The city council is planning to place a city park in this area. How large is the area of the planned park?

13. On the map, represent the locations as points on the coordinate plane. The elementary school is located at (-4, 2), the middle school is located at (2, 2), and, the high school is located at (-4, -3).



A. Each interval on the number lines represents 2 miles (0 to 1 represents 2 miles). Each school forms the vertex of a rectangle. If the district office for the school system is the fourth vertex of the rectangle, what are the coordinates? How do you know?

B. What are the length and width of the rectangle?

C. What is the perimeter of the rectangle?

D. What is the area of the rectangle?