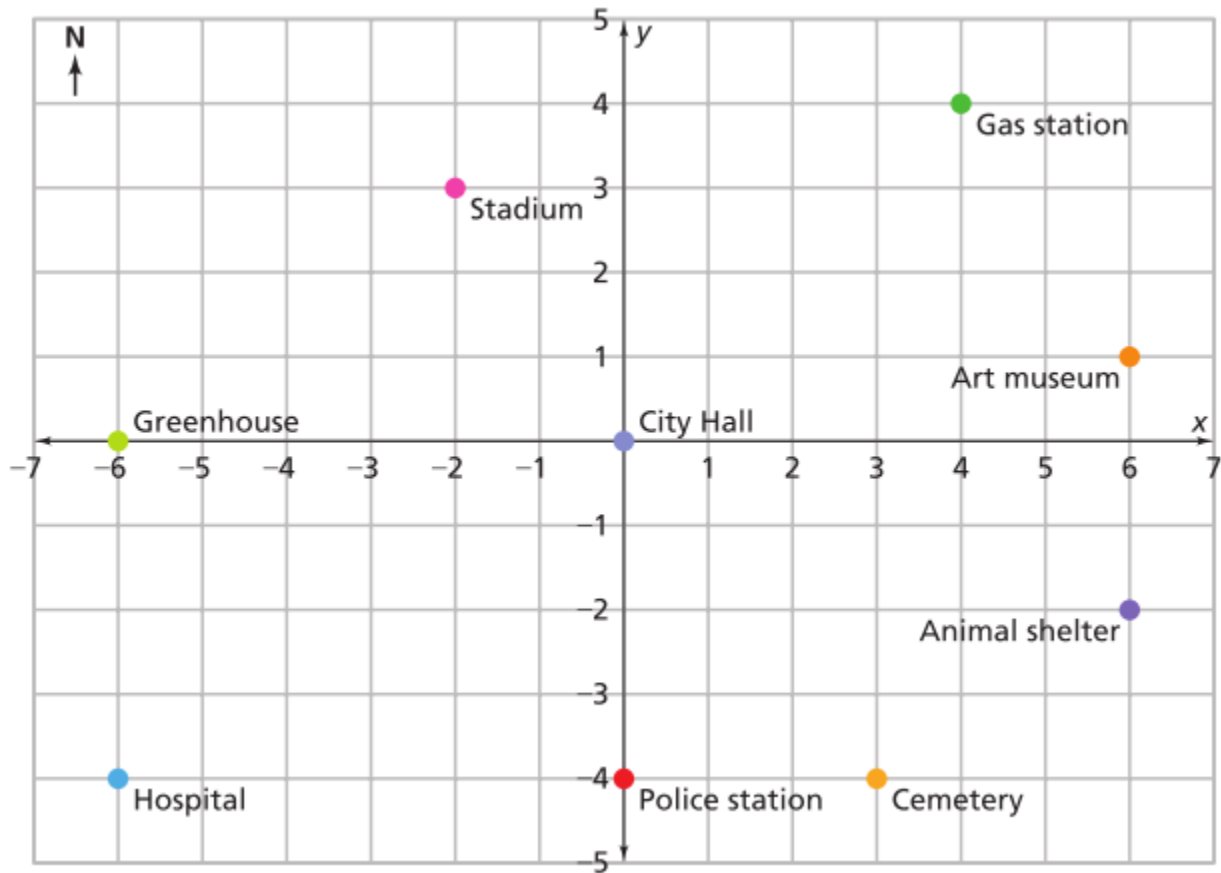


Intelligence without perseverance is useless.

The founders of the city of Euclid loved math. They named their city after a famous mathematician, and they designed the street system to look like a coordinate grid. The Euclideans describe the locations of buildings and other landmarks by giving coordinates. For example, the art museum is located at (6, 1).



1. Give the coordinates of each landmark:
 - a) art museum
 - b) hospital
 - c) greenhouse

2. What is the shortest driving distance from the animal shelter to the stadium?

3. What is the shortest driving distance from the hospital to the gas station?

4. What are the coordinates of a point halfway from City Hall to the hospital if you travel by taxi? Is there more than one possibility? Explain.



5. What are the coordinates of a point halfway from City Hall to the hospital if you travel by helicopter? Is there more than one possibility? Explain.

6a) Which landmarks are 7 blocks from City Hall by car?

b) Give precise driving directions from City Hall to each landmark you listed in part a).

7. Euclid Junior High is located at the intersection of two streets. The school is the same driving distance from the gas station as the hospital is from the greenhouse.

a) List the coordinates of each place on the map where the school might be located.

b) Find the flying distance, in blocks, from the gas station to each location you listed in part a).

8. The points $(0, 0)$ and $(3, 2)$ are two vertices of a polygon with integer coordinates. What could the other vertex be if the polygon is a right triangle?

9. John walks 2 blocks west from the police station and then walks 3 blocks north. Give the coordinates of the place where he stops.

10. John's friend Maria is at City Hall. She wants to meet John at his ending location from question 9. What is the shortest route she can take if she walks along city streets?

Is there more than one possible shortest route?

11. In the city of Euclid, the length of each block is 150 meters. Use this information and the map to find the shortest driving distance in meters from City Hall to the animal shelter.

12. If the length of each block is 150 meters, between which two landmarks is the shortest driving distance 750 meters?