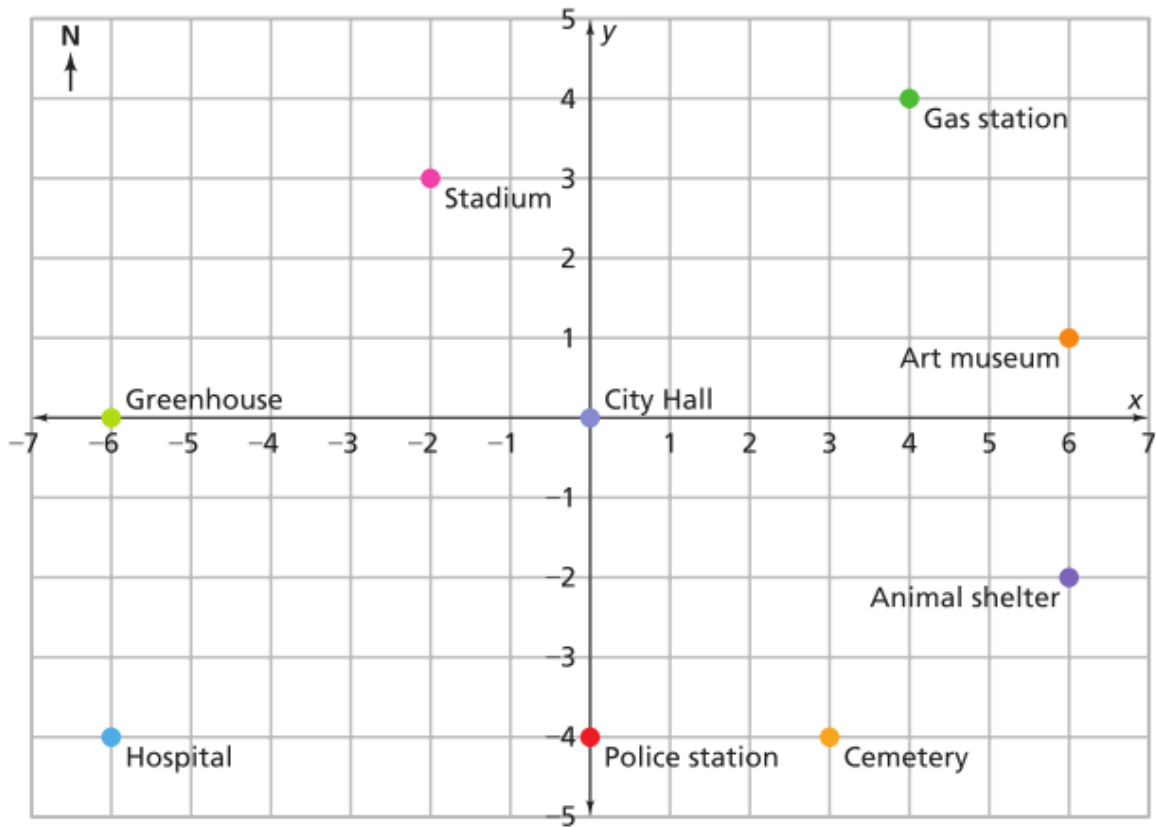


The founders of the city of Euclid loved math. They named their city after a famous mathematician, and they designed the street system to look like a coordinate grid. The Euclideans describe the locations of buildings and other landmarks by giving coordinates. For example, the art museum is located at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



- Give the coordinates of each landmark:
 - gas station
 - animal shelter
 - stadium

- Euclid's chief of police is planning emergency routes. She needs to find the shortest driving route. Give precise directions for an emergency car route for each pair of locations.
 - the police station to City Hall:
 - the hospital to City Hall:
 - the hospital to the art museum:

- For each pair, find the total distance in blocks a police car following your route would travel.
 - the police station to City Hall:
 - the hospital to City Hall:
 - the hospital to the art museum:

4. Suppose you know the coordinates of two landmarks in Euclid. How can you determine the shortest driving distance (in blocks) between them?
5. A helicopter can travel directly from one point to another. For each pair in Question 2, find the total distance (in blocks) a helicopter would have to travel to get from the starting location to the ending location. You may find it helpful to use a centimeter ruler.
- a) the police station to City Hall:
 - b) the hospital to City Hall:
 - c) the hospital to the art museum:
6. Will a direct helicopter route between two locations always be shorter than a car route? Explain your reasoning.

The Euclid City Council is developing parks with geometric shapes. For some of the parks, the council gives the park designers constraints. For example, Descartes Park must have a border with vertices $(1, 1)$ and $(4, 2)$.

7. Suppose the park is to be a square. What could the coordinates of the other two vertices be? Give two answers.
8. Suppose the park is to be a nonsquare rectangle. What could the coordinates of the other two vertices be?
9. Suppose the park is to be a right triangle. What could the coordinates of the other vertex be?
10. Suppose the park is to be a parallelogram that is not a rectangle. What could the coordinates of the other two vertices be?