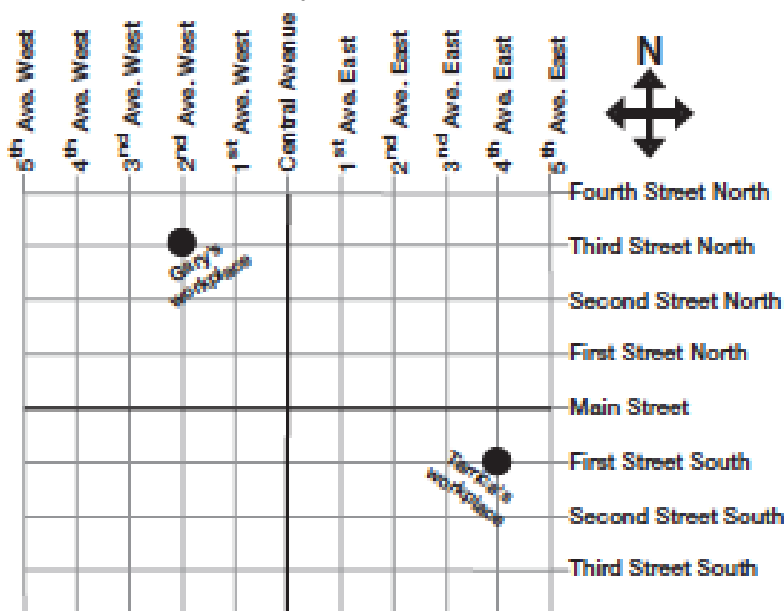


1. Gary and Tarrica live and work in Hansom City. In the map below, find the Euclidean distance *and* the taxicab distance from Gary's to Tarrica's workplace.



2. The taxicab distance between the two workplaces is usually greater than the Euclidean distance between them. When are the taxicab distance and the Euclidean distance equal?
3. Gary and Tarrica are looking for an apartment. They would like to live the same distance from their jobs. Find five points that are the same Euclidean distance from both workplaces and mark them on the map.
4. Find at least eight points that are the same taxicab distance from both workplaces and mark them on the map in a different color.

A convenient way to describe a location is to give its address. On this map, avenues run north and south, and streets run east and west. Gary's workplace is located at the intersection of Second Avenue West and Third Street North.

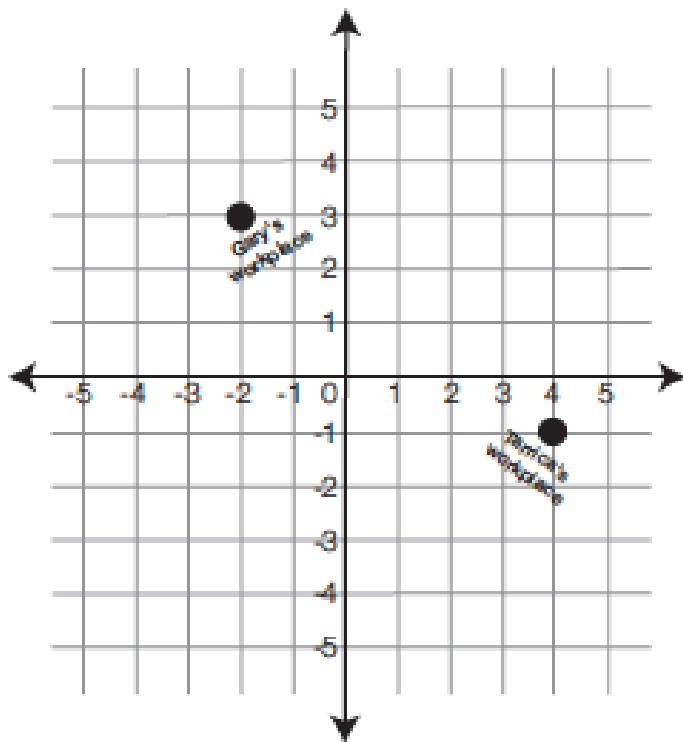
5. A police dispatcher has received a report of an accident at Gary's workplace. Two patrol cars are in the area. Adam-10 is at the intersection of Third Street North and Fourth Avenue East. Adam-12 is at Main Street and Second Avenue East.

Which car is closer to the accident using Euclidean distance? _____

Which one is closer using taxicab distance? _____

Which car should respond? _____

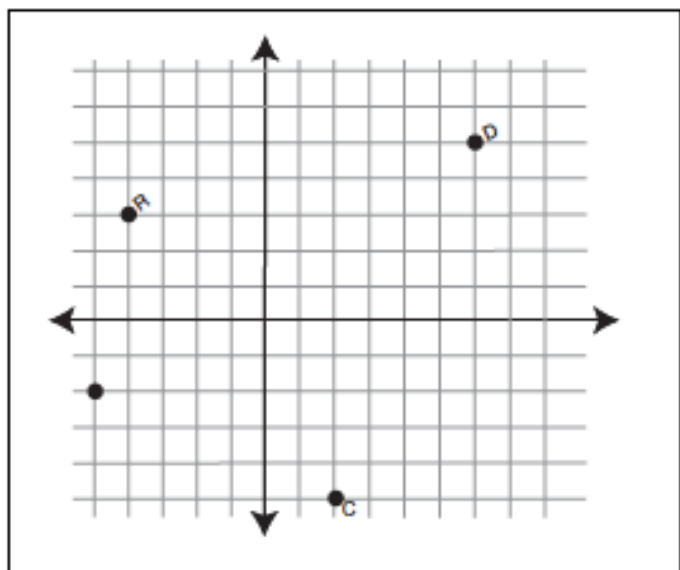
Street names get cumbersome to use, so we will use coordinates. Let the intersection of Central Avenue and Main Street be the point $(0, 0)$. Avenues to the west of Central Avenue and streets south of Main Street will have negative numbers. Gary's workplace, then, would be located at $(-2, 3)$.



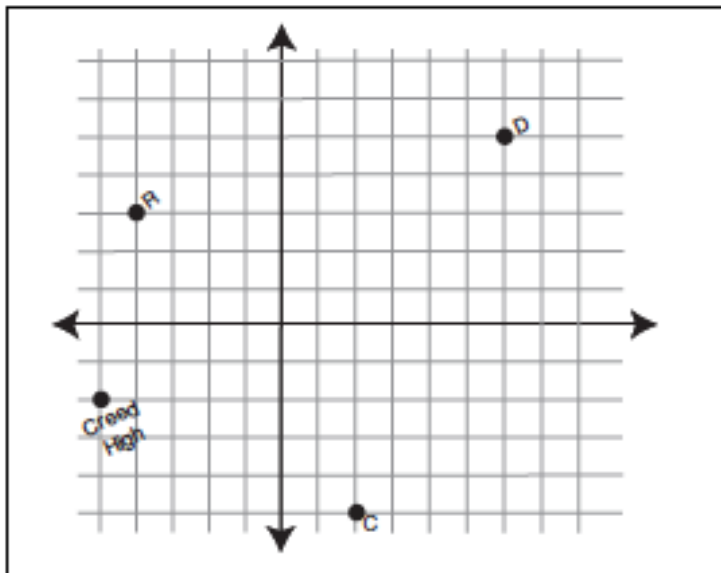
6. Draw the set of all points that are the same taxicab distance from the two given points:
 - a. $X(-2, 5)$ and $Y(0, -3)$
 - b. $A(-3, -4)$ and $B(1, 3)$

Try to discover a shortcut for drawing such sets of points. A shortcut will be useful in some of the remaining problems.

7. Hansom City has three high schools. Ruffner High is located at $(-4, 3)$, Casey High is at $(2, -5)$, and Dahl High is at $(6, 5)$. Draw the school boundaries so that each student attends the school closest to his or her home, as the taxi (or school bus) drives.



8. Sandy Burger, the fast-food chain, wants to open a new restaurant that is “centrally located” so that it is the same taxicab distance from each of the three high schools. Where should it be located?
9. A new school, Creed High School, is going to be built at $(-5, -2)$. See the graph below.
- Draw the boundaries for the new attendance zones of each high school, keeping in mind that each student will attend the school that is closest to his or her home.
 - Which of the previous districts will have new boundaries?



10. This problem is about “circles” in taxicab geometry. Guess what, they don’t look like circles!
- Because Gary goes to work early in the morning, he wants to live within three blocks of his workplace. Describe the region in which he and Tarrica can live.
 - Tarrica does not want to live more than ten blocks from her workplace. For this scenario, describe where they could live.
 - Where could they live to satisfy both Gary and Tarrica?

