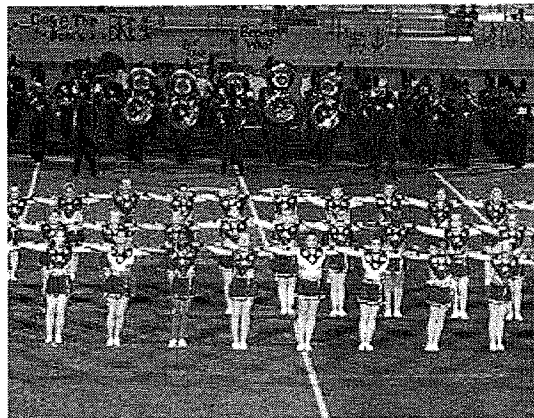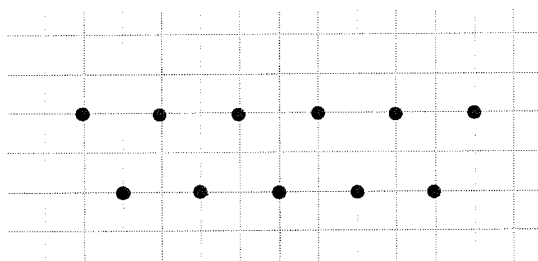# 7.1 Go the Distance
A Develop Understanding Task

The performances of the Podunk High School drill team
are very popular during half-time at the school's football
and basketball games. When the Podunk High School
drill team choreographs the dance moves that they will
do on the football field, they lay out their positions on a
grid like the one below:

In one of their dances, they plan to make patterns holding long, wide ribbons that will span from
one girl in the middle to six other girls. On the grid, their pattern looks like this:
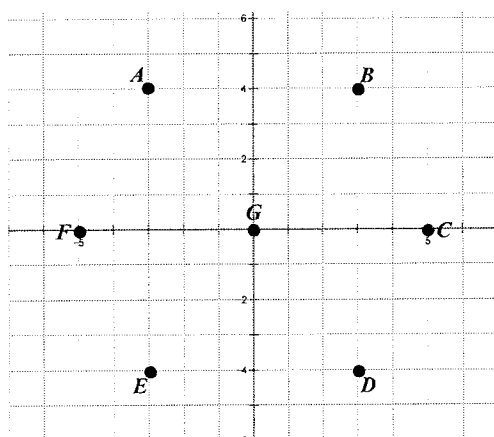
The question the girls have is how long to make the ribbons. Some girls think that the ribbon from Gabriela (G) to Courtney (C) will be shorter than the one from Gabriela (G) to Brittney (B).

1. How long does each ribbon need to be?

2. Explain how you found the length of each ribbon.

When they have finished with the ribbons in this position, they are considering using them to form a new pattern like this:
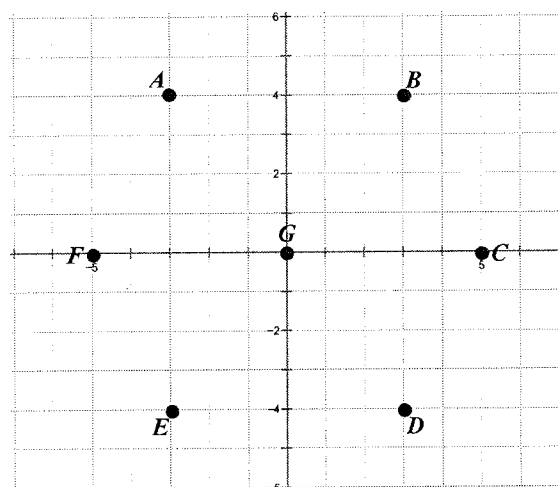
3. Will the ribbons they used in the previous pattern be long enough to go between Britney (B) and Courtney (C) in the new pattern? Explain your answer.

Gabriela notices that the calculations she is making for the length of the ribbons reminds her of math class. She says to the group, "Hey, I wonder if there is a process that we could use like what we have been doing to find the distance between any two points on the grid." She decides to think about it like this:

"I'm going to start with two points and draw the line between them that represents the distance that I'm looking for. Since these two points could be anywhere, I named them A (x_1, y_1) and B (x_2, y_2). Hmmmmm. . . . when I figured the length of the ribbons, what did I do next?"
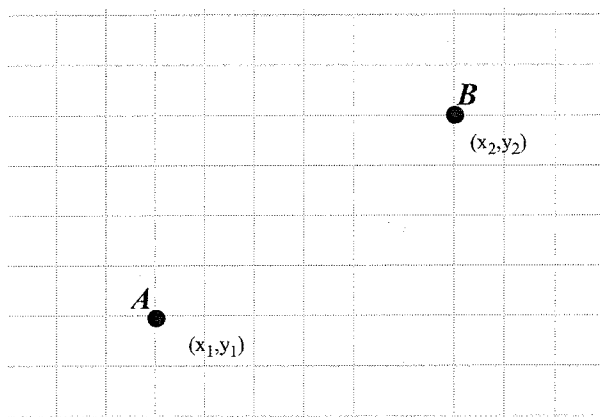
4. Think back on the process you used to find the length of the ribbon and write down your steps here, using points A and B.

5. Use the process you came up with in #4 to find the distance between two points located at $(-1, 5)$ and $(2, -6)$

6. Use you process to find the perimeter of the hexagon pattern shown in #3.