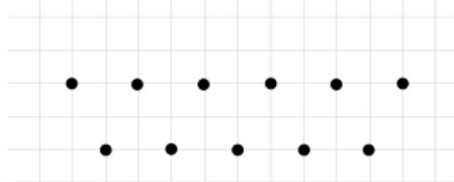
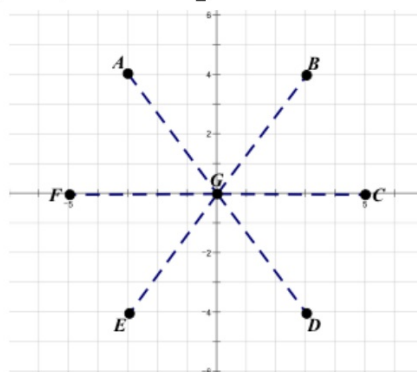


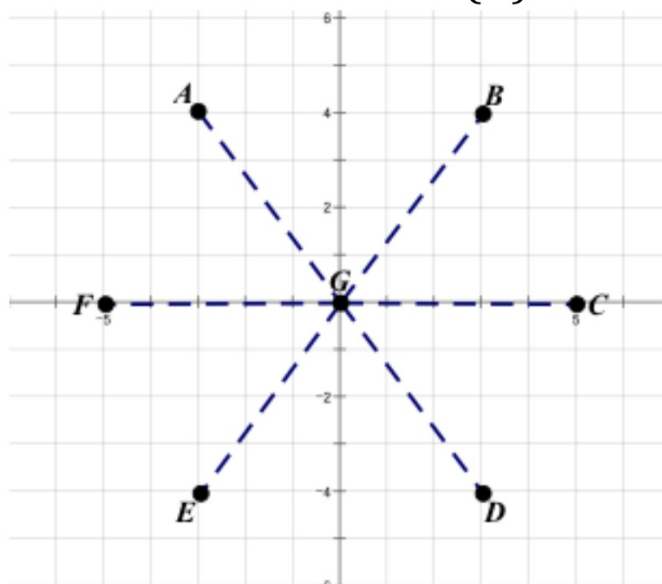
The performances of the Podunk High School drill team are very popular during half-time at the school's football and basketball games. When the Podunk High School drill team choreographs the dance moves that they will do on the football field, they lay out their positions on a grid like the one below



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:



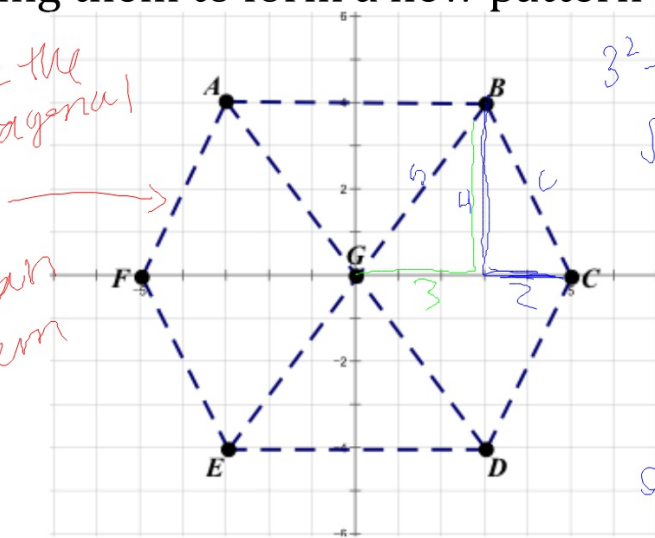
The question the girls have is how long to make the ribbons. Some girls think that the ribbon from Gabriela (G) to Courtney (C) will be shorter than the one from Gabriela (G) to Brittney (B).



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:

To measure the length of diagonal lines we need the Pythagorean theorem



$$3^2 + 4^2 = C^2$$

$$\sqrt{25} = \sqrt{C^2}$$

$$5 = C$$

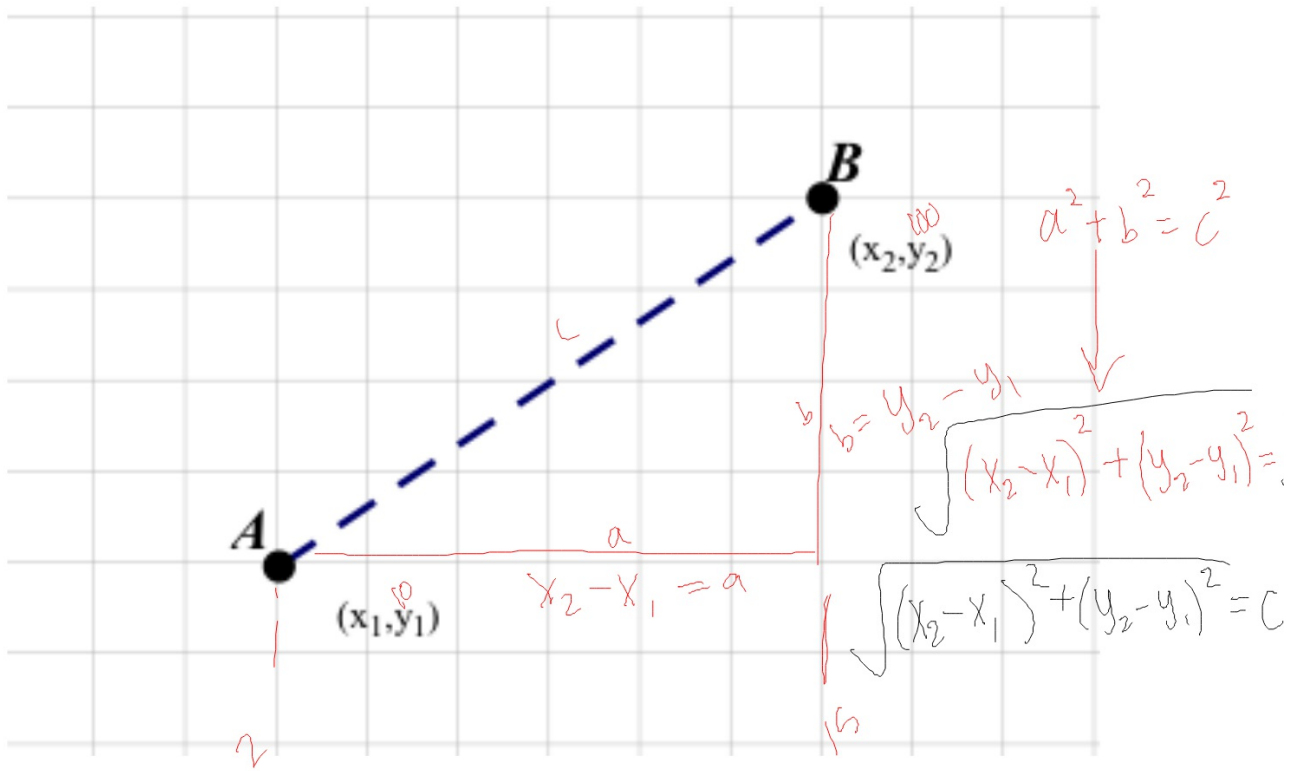
$$2^2 + 4^2 = C^2$$

$$\sqrt{20} = \sqrt{C^2}$$

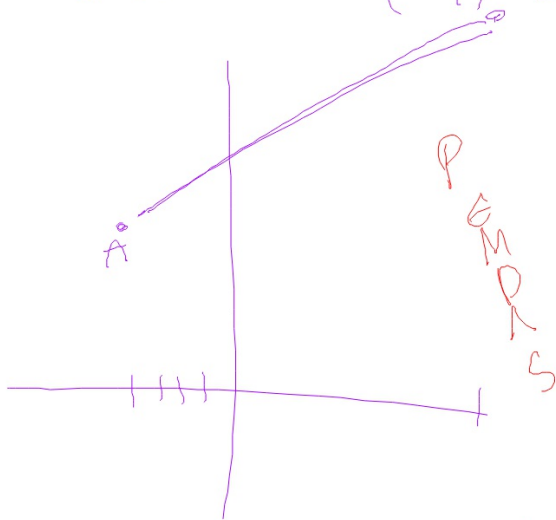
exact $\sqrt{20} = C$

close $4.47 \approx C$

1. 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.



Use the distance formula to find the distance between $(-4, 57)$ and $(19, 181)$



$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$= \sqrt{(19 - (-4))^2 + (181 - 57)^2}$$

$$= \sqrt{(19 + 4)^2 + (124)^2}$$

$$= \sqrt{23^2 + 124^2}$$

$$= \sqrt{529 + 15,376}$$

$$= \sqrt{15,905}$$

exact \rightarrow

≈ 126.1
 $(126.1)^2$ close \rightarrow

$$\begin{matrix} x_1, y_1 & & x_2, y_2 \\ (2, 2) & \text{and} & (-3, 3) \end{matrix}$$

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$= \sqrt{(-3 - 2)^2 + (3 - 2)^2}$$

$$= \sqrt{(-5)^2 + (1)^2}$$

$$\sqrt{25 + 1}$$

$$\sqrt{26}$$

$$-5 \cdot 5$$

$$-5^2 = -25$$

$$(-5)^2 = 25$$

$$(5)(5) \nearrow$$

Perimeter :

$$6 + 6 + \sqrt{20} + \sqrt{20} + \sqrt{20} + \sqrt{20} = 12 + 4\sqrt{20}$$

exact

≈ 29.98
close

