Topics: x, y-plane and coordinate system, quadrants, plotting points, distance formula

Student Learning Outcomes:

1. Students will be able to plot points in an x, y-plane using a coordinate system.
2. Students will be able to determine the distance between two points on an x, y-plane using the distance formula.

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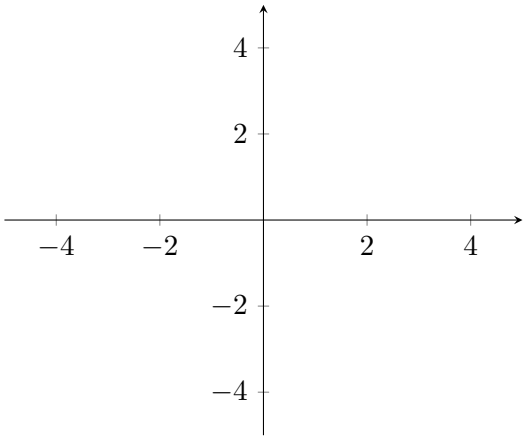
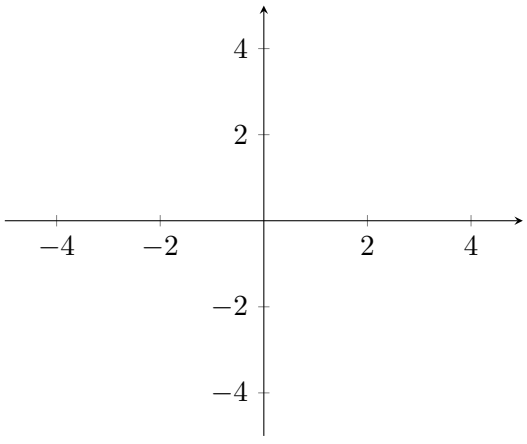
1 Rectangular Coordinate System



1. First, label the x and y axes on the rectangular coordinate system below. Then plot and label the given points.

$A(2, -3)$ $B(-2, 0)$ $C(-1, 2)$



2 The Distance Formula

We have just completed an activity called Crowd Crumple. You should now have a piece of paper with a graph, two labeled points, and a line connecting those two points labeled d.

1. Use prior knowledge to find the distance between the two points on your paper or make a reasonable guess and write your answer below.

2. Determine the horizontal and vertical distances between your two points.

   (a) Determine the **horizontal distance** between your points (x_1, y_1) and (x_2, y_2):
   (This is the distance between the x-values.)

   (b) Determine the **vertical distance** between your points (x_1, y_1) and (x_2, y_2):
   (This is the distance between the y-values.)

   (c) Draw lines on your graph to represent the horizontal and vertical distances between your two points. Do your lines form a recognizable shape?

   (d) How can we use these two values to determine the straight-line distance d between your points (x_1, y_1) and (x_2, y_2)?

   (e) Calculate the distance between your points (x_1, y_1) and (x_2, y_2).

The Distance Formula: The distance between points $(x_1, y_1$ and (x_2, y_2) is given by $d =$

3. Use the distance formula to calculate the distance between the points $(1, 5)$ and $(4, 9)$.

3 Student Learning Outcomes Check

1. Can you plot points in an x, y-plane using a coordinate system?

2. Are you able to determine the distance between two points on an x, y-plane using the distance formula?

If any of your answers were no, please ask about these topics in class.