

11.5 Distance in The Coordinate Plane a.1

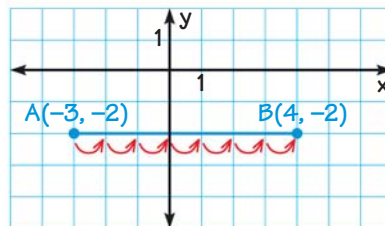
MATERIALS • graph paper

QUESTION How can you find the distance between two points?

EXPLORE Find the distance between points $A(-3, -2)$ and $B(4, -2)$

STEP 1 Plot points

Plot the points $A(-3, -2)$ and $B(4, -2)$ in the same coordinate plane.



STEP 2 Find distance

Find the distance between the points by counting the grid lines between them.

STEP 3 Find distance

Find the distance by subtracting the x -coordinate of point A from the x -coordinate of point B .

STEP 4 Compare results

How does your result from Step 2 compare with your result from Step 3?

DRAW CONCLUSIONS Use your observations to complete these exercises

- Subtract the x -coordinate of point B from the x -coordinate of point A . How is the value different from the values found in Steps 2 and 3 above? How could you make them the same?
- Assume points $C(x_1, y_1)$ and $D(x_2, y_2)$ lie on the same horizontal line. Write an expression that can be used to find the distance between the points.
- Assume points $C(x_1, y_1)$ and $D(x_2, y_2)$ lie on the same vertical line. Write an expression that can be used to find the distance between the points. Check your expression using $(-2, 4)$ and $(-2, -3)$.

In Exercises 4–12, find the distance between the two points.

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|------------------------|-------------------------|------------------------|
| 4. $(2, 3), (-5, 3)$ | 5. $(0, -4), (7, -4)$ | 6. $(-1, 5), (2, 5)$ |
| 7. $(4, -6), (6, -6)$ | 8. $(-5, -4), (-2, -4)$ | 9. $(2, 8), (2, 3)$ |
| 10. $(5, -6), (5, -2)$ | 11. $(0, -4), (0, 2)$ | 12. $(-3, 0), (-3, 6)$ |
13. **REASONING** Plot the points $A(6, 5)$, $B(2, 5)$, and $C(6, 2)$. Find the distance between points A and B . Find the distance between points A and C . Use the distances and the Pythagorean theorem to find the distance between points B and C .