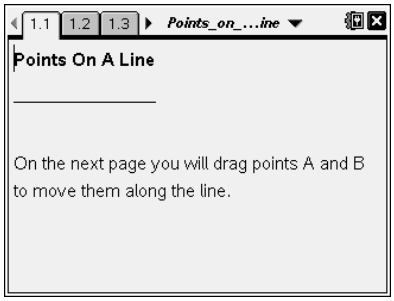
Points on a Line
Student Activity

Name _____

Class _____

Open the TI-Nspire document *Points_on_a_Line.tns.*

Two points on a line in the coordinate plane have a special relationship. In this activity, you will use coordinates to better understand that relationship.



Move to page 1.2.

Press ctrl ▶ and ctrl ◀ to navigate through the lesson.

1. Describe how the position of point *C* changes as you move point *A*.

2. Describe how the position of point *C* changes as you move point *B*.

3. a. Move point *A* to the third quadrant and point *B* to the first quadrant. Describe how you get from point *A* to point *C* and from point *C* to point *B*. Be precise in terms of the number of units and the directions.

   b. Now move point *A* to the first quadrant and point *B* to the second quadrant. Describe how you get from point *A* to point *C* and from point *C* to point *B*. Be precise in terms of the number of units and the directions.

4. Position point *A* so that you have to move up 6 units to get from point *A* to point *C*. How many units, and in what direction, must you move to get from point *C* to point *B*?

5. Make a conjecture about the relationship between the number of units and direction from point *A* to point *C* and from point *C* to point *B*. Choose some new points for *A* and *B*, and verify your conjecture.

6. Look at your plot. What is the vertical change from point *A* to point *B*? What is the horizontal change? Explain how you found your answers.

7. Find the ratio of vertical change to horizontal change for several pairs of points on the line. What do you observe about the ratios?

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8. a. Record the information in row 1 in the table below.

   b. Find the missing values for any points *A* and *B* on the line. Explain your reasoning.

	Coordinates of Point *A*	Coordinates of Point *B*	Vertical Change (*A* to *C*) / Horizontal Change (*C* to *B*)
1	(–8,)	(, 5)	
2	(–6,)	(,)	$\frac{2}{4}$
3	(, 3)	(,)	$\frac{3}{6}$
4	(6,)	(,)	$\frac{-6}{-12}$

9. Describe how the information in the table in question 8 relates to your observations in question 7.

10. Suppose points *A* and *B* are on the line but are not displayed in the window of the document. If the vertical change from point *A* to point *B* is 50, what is the horizontal change? Explain your reasoning.

11. For a different line, the coordinates of point *A* are (–3, –4) and the ratio of the vertical change to the horizontal change is equivalent to $\frac{2}{3}$. Find the coordinates of another point on the line.

    Explain your reasoning.

12. Describe the line if the movement from point *A* to point *B* is described as “down 4 units and right 2 units.” Make a sketch to show your thinking.