Point-Slope Form of a Line - Activity A

Exploration Guide

1. First, make sure that \( m \) is set equal to 1. (To quickly set a slider to a specific number, type the number into the field to the right of the slider, and then press ENTER.) Then vary the value of \( x_1 \) using the \( x_1 \) slider.
   1. What happens to the graph of the line when \( x_1 \) changes?
   2. What happens to the slope of the line?
   3. How does the equation of the line change as \( x_1 \) changes?
2. With \( m = 1 \), set \( x_1 = 3 \) and \( y_1 = 4 \).
   1. What is the point-slope equation of this line?
   2. What do the values of \( x_1 \) and \( y_1 \) correspond with on the graph?
3. Set \( x_1 = \bar{1} \). Why does the right-hand side of the equation contain \( (x + 2) \) and not \( (x \bar{1} 2) \)?
4. Increase the value of \( x_1 \) by dragging the \( x_1 \) slider to the right.
   1. How does increasing \( x_1 \) affect the graph?
   2. Next, decrease the value of \( y_1 \) using the \( y_1 \) slider. How does this affect the graph?
5. Vary the value of \( m \) by using the \( m \) slider. What does \( m \) represent in the point-slope form of the equation of a line?
6. What is the equation of the line with a point at \((5, \bar{1} 2)\) and a slope of \( \bar{1} 1.5 \), in point-slope form? Write down your answer. Then check it using the Gizmo™.
7. Drag the point shown on the graph to \((4, \bar{1} 3)\) and set the slope to \( \bar{1} 1 \). What is the equation of this line in slope-intercept form? Check your answer by turning on Show slope-intercept form.
8. Graph \( y \bar{6} = \bar{1} 3(x \bar{1} 2) \) using the Gizmo. Click on the TABLE tab to view a table of values for the current equation.
   1. What is the value of \( y \) when \( x = 0 \)?
   2. What is the slope-intercept form of the equation of the line? Go to the CONTROLS view and check your answer by turning on Show slope-intercept form.
9. What are the advantages of using point-slope form instead of slope-intercept form?
   Disadvantages?