The **point-slope form** of a nonvertical linear equation is *y* – *y*1 = *m*(*x* – *x*1).

In this equation, *m* is the slope and (*x*1,*y*1) is a point on the graph of the equation.

**Example:** A line passes through (5, –2) and has a slope –3. What is an equation for this line in point-slope form?

|  |  |
| --- | --- |
| *y* – *y*1 = *m*(*x* – *x*1) | Use point-slope form. |
| *y* – ( – 2) = – 3(*x* – 5) | Substitute (5, – 2) for (*x*1, *y*1) and – 3 for *m*. |
| *y* + 2 = – 3(*x* – 5) | Simplify. |

**Example:** A line passes through (1, 4) and (2, 9). What is an equation for this line in point-slope form? What is an equation for this line in slope-intercept form? First use the two given points to find the slope.



Use the slope and one point to write an equation in point-slope form.

|  |  |
| --- | --- |
| *y* – *y*1 = *m*(*x* – *x*1) | Use point-slope form |
| *y* – 4 = 5(*x* – 1) | Substitute (1, 4) for (*x*1, *y*1) and 5 for *m*. |
| *y* – 4 = 5*x* – 5 | Distributive Property |
| *y* = 5*x* – 1 | Add 4 to each side. |

An equation in point-slope form is *y* – 4 = 5(*x* – 1). An equation in slope-intercept form is *y* = 5*x* – 1.

**Write an equation for the line through the given point and with the given slope *m*.**

|  |  |  |
| --- | --- | --- |
| **1.** (–1, 3); *m* = – | **2.** (7, –5); *m* = 4 | **3.** (–2, –5); *m* =  |

**Write an equation in point-slope form of the line through the given points.**

***Then* write the equation in slope-intercept form.**

|  |  |  |
| --- | --- | --- |
| **4.** (1, 4) and (2, 7) | **5.** (2, 0) and (3, –2) | **6.** (4, –5) and (–2, –2) |

**Write an equation in point-slope form for each line.**

**7**.  **8**.  **9.** 

**10**. A sign says that 3 tickets cost $22.50 and that 7 tickets cost $52.50.

 Write an equation in point-slope form that represents the cost of tickets.