Section 5.3
Point-Slope Form
I understand point-slope form.
I can write a linear equation in point-slope form when given the slope and a point.
I can write a linear equation in point-slope form when given two points.
I can graph a linear equation written in point-slope form.
Where do you think these #s are coming from?
Point-Slope Form

\[ y - y_1 = m(x - x_1) \]

\( m \) - Slope
\( x_1 \) and \( y_1 \) - Come from the given point. \( (x_1, y_1) \)
\( y \) and \( x \) - Stays the same.
The minus signs are always there. Only change if the coordinate is negative.
Write the equation in point-slope form of the line passing through the point and having the given slope.

\[(2,1), \ m = 2\]

\[y - y_1 = m(x - x_1)\]

\[y - 1 = 2(x - 2)\]
\( (3,5) \ m = -1 \)
\[ y - 5 = -1(x - 3) \]
\[ y - y_1 = m(x - x_1) \]
\( (7, -1) \ m = -6 \)
\[ y + 1 = -6(x - 7) \]

\( (5, -1) \ m = -2 \)
\[ y + 1 = -2(x - 5) \]

\( (-6, 6) \ m = \frac{3}{2} \)
\[ y - 6 \div \frac{3}{2} (x + 6) \]
Which equation represents the line that passes through the point \((-6, 2)\) and has a slope of \(-1\)?

<table>
<thead>
<tr>
<th>Option</th>
<th>Equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>(y + 2 = -(x + 6))</td>
</tr>
<tr>
<td>B</td>
<td>(y + 2 = -(x - 6))</td>
</tr>
<tr>
<td>C</td>
<td>(y - 2 = -(x + 6))</td>
</tr>
<tr>
<td>D</td>
<td>(y + 1 = -2(x + 6))</td>
</tr>
</tbody>
</table>
Write the equation of the line in point-slope form.

$$(4,3)$$

$$- (3,1)$$

$$m = 2$$

$$y-1=2(x-3)$$
Write the equation of the line in point-slope form.

\( (0,3) \)

\( m = \frac{1}{1} \)

\( y - 3 = 1(x) \)
Write the equation of the line in point-slope form
Graph: $y - 5 = \beta(x - 1)$

$(1, 5)$

$m = \frac{3}{1}$
Graph: \( y + 3 = -2(x - 2) \)

\((2, -3)\)

\(m = -\frac{2}{1} \text{ or } \frac{2}{-1} \)
Graph: \( y - 1 = \frac{3}{4}(x + 1) \)
Write the equation of the line in point-slope form.

\((7,2), (2, 12)\)

\[m = -2\]

\[y - 2 = -2(x - 7)\]
Write the equation of the line in point slope form.

(6,-2), (12, 1)  (-4,-1), (6, -7)
From 1990 to 2000, the number of thousand visits by people to Bryce Canyon National Park increased by about 23.9 thousand visits per year. In 2000, there were about 1102.4 thousand visits to the park.

a. Write an equation to represent this situation.

b. How many visits were made to the park in 1995?

\[(10, 1102.4)\]
The population density of New Mexico increased at a relatively constant rate from 1980 to 1999. In 1985, the population density was about 11.62 people per square mile. In 1999, the population density was about 14.28 people per square mile. Write an equation that gives the population density (in people per square mile) as a function of the number of years since 1980. What was the population density in 1990?