NOTES: Lesson 4-14: Comparing Rate of Change & Initial Value

Slope \((m)\) is the “rate of change,” or “unit rate.” Examples: 30 miles per hour, $9.50 per hour.

Y-intercept \((b)\) is the “initial value,” or “starting place.” Example: \((0, \underline{\quad})\)

1.) Angela and Ben each have a monthly cell phone bill. Angela’s monthly cell phone bill is represented by the graph below. Ben’s monthly cell phone bill is represented by the equation \(y = 0.15x + 49\), where \(x\) represents the number of minutes and \(y\) represents the monthly cost.

**Angela’s Cell Phone Plan**

**Ben’s Cell Phone Plan**

\[ y = 0.15x + 49 \]

\[ m = \frac{y_2 - y_1}{x_2 - x_1} \]

- \(m = \frac{72 - 60}{120 - 60}\) per minute
- \(m = \frac{12}{120}\) per minute
- \(m = $0.10\) per minute

Part A: Find the rate of change for the two plans.

- Angela: $0.10 per minute.
- Ben: $0.15 per minute.

Part B: Identify the initial value for the two plans.

- Angela: $60 (0, 60) \( (\text{at 0 minutes the cost is $60}) \)
- Ben: $49 (0, 49)

Part C: Calculate the total cost of each plan if they talked for 200 minutes this month.

- Angela: $80 \( (\text{look at the point } 200, 80) \)
- Ben: $79

\[ y = 0.15(200) + 49 \]

\[ y = 79 \]
2.) Jenna and Ricky each have their own savings account. The table below represents the amount of money Jenna has in her savings account over the course of three weeks. The graph below represents the amount of money Ricky has in his savings account over the course of 8 weeks.

<table>
<thead>
<tr>
<th>Jenna’s Savings Account</th>
<th>Ricky’s Savings Account</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Weeks</td>
<td>Amount in Savings Account ($)</td>
</tr>
<tr>
<td>0</td>
<td>50</td>
</tr>
<tr>
<td>1</td>
<td>60</td>
</tr>
<tr>
<td>2</td>
<td>70</td>
</tr>
<tr>
<td>3</td>
<td>80</td>
</tr>
<tr>
<td>4</td>
<td>90</td>
</tr>
<tr>
<td>5</td>
<td>100</td>
</tr>
<tr>
<td>6</td>
<td>110</td>
</tr>
</tbody>
</table>

\[ m = \frac{\Delta y}{\Delta x} \]
\[ m = \frac{10}{1} \]
\[ m = \$10 \text{ per week} \]

Part A: Find the rate of change for Jenna and Ricky.

Jenna: $\_10\_ \text{ per week.}$

Ricky: $\_25\_ \text{ per week.}$

Part B: Identify the initial value for Jenna and Ricky’s bank account.

Jenna: $\_50\_ \text{ (0, 50)}$

Ricky: $\_0\_ \text{ (0, 0)}$

Part C: Determine how much money Jenna and Ricky will have in their bank accounts after 6 weeks.

Jenna: $\_110\_$

Ricky: $\_150\_$

Part D: Who has more money in their bank account after 6 weeks? How much more do they have?

Ricky has more money in his bank account after 6 weeks. He has $\_40\_ \text{ more. (150-110)}$