A & W 11 Notes

Working with Slope as a Rate of Change:

What is the slope of the dotted line?

\[ \text{Slope} = \frac{\text{rise}}{\text{run}} = \frac{150}{2} = \frac{75}{1} \frac{\text{km}}{\text{h}} \]

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

What is the slope of the solid line?

\[ m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{200 - 50}{4 - 1} = \frac{150}{3} \frac{50}{1} \frac{\text{km}}{\text{h}} \]

Rate of Change: the rate at which one variable changes compared to another

Independent Variable: a variable whose value can be freely chosen and not dependent on another value

- HORIZONTAL

Dependent Variable: a variable whose value relies on the value of another variable

- VERTICAL
Example 2: Willard works as an electrician's assistant and earns $12.25 per hour.

What is the dependent variable? $\rightarrow \text{TIME} \rightarrow \text{MD.}$

Graph the situation

<table>
<thead>
<tr>
<th>Time (h)</th>
<th>Money ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>24.50</td>
</tr>
<tr>
<td>4</td>
<td>49.00</td>
</tr>
<tr>
<td>6</td>
<td>73.50</td>
</tr>
<tr>
<td>8</td>
<td>98.00</td>
</tr>
</tbody>
</table>

What is the slope of the graph and what does it represent?

\[
\begin{align*}
(3, 24.50) & (6, 73.50) \\
\frac{y_2 - y_1}{x_2 - x_1} & = \frac{73.50 - 24.50}{6 - 2} \\
& = \frac{49}{4} = 12.25 \text{ Rate or Pay}
\end{align*}
\]

How much will Willard earn in 12 hours?

\[
P = 12.25 \times 12 = 147.00
\]

If he earned $183.75 on a job, how many hours did he work?

\[
P = 12.25 \times t \\
183.75 = 12.25 \times t \\
\frac{183.75}{12.25} = t \\
15 \text{ hr = t}
\]
Example 3: Reg timed himself jogging on a race course. He passed the 300 m point in 1.5 minutes after starting, and the 600 m point after 2.8 minutes.

a) Show this on a graph

b) What was his average rate in m/min for this portion of the race?

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

\[
= \frac{600 - 300}{2.8 - 1.5}
\]

\[
= \frac{300}{1.3} = 230.7692308
\]

"m" = 230.77 m/min