Mat 011 Agenda    Day 16: 02/26/03

- Return Quiz
- Graphing Lines, S113 PowerPoint 15
- Introduction to Slope, S133, S145
  PowerPoint Lecture16

Homework: **Topic 15, page S129; Topic 16, page S149**
\[-3x \neq 21\]
\[
\frac{-3}{-3} \quad \frac{21}{-3}
\]
\[x < -7\]

\[\infty, -7, -7\]
$10x + 6 \geq 2(x - 5)$

$10x + 6 \geq 2x - 10$

$-6 \quad -6$

$10x \geq 2x - 16$

$-2x \quad -2x$

$8x \geq -16$

$\frac{8x}{8} \geq \frac{-16}{8}$

$x \geq -2$

$\left[ -2, \infty \right)$
\[-17 < 3x - 5 \leq 4\]

\[
\frac{-12}{3} < \frac{3x}{3} < \frac{9}{3}
\]

\[-4 < x \leq 3\]

\([-4, 3]\)
- Graph a line by plotting points
- Graph a line by plotting the intercepts
- Determine Slope
- Calculate the Average Rate of Change
- Calculate the Percent Change
y-axis

(0, y)

(x, 0)

intercepts

x-axis
$y = 3x - 4$

<table>
<thead>
<tr>
<th>$x$</th>
<th>$y$</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-4</td>
</tr>
<tr>
<td>1.3</td>
<td>0</td>
</tr>
</tbody>
</table>

Given $y = 3x - 4$, we can solve for $x$ when $y = 0$.

\[ 0 = 3x - 4 \]
\[ 4 = 3x \]
\[ \frac{4}{3} = \frac{3x}{3} \]
\[ 1.3 = x \]

The point $(1.3, 0)$ lies on the graph of $y = 3x - 4$. The graph shows the $y$-axis, and the point $(1.3, 0)$ is marked on the line.
$y = 3x - 4$
Graph using intercepts

\[ 3x + 2y = 6 \]

\[
\begin{align*}
0 + 2y &= 6 \\
y &= 3 - \frac{3}{2}x
\end{align*}
\]

\[
\begin{array}{c|c|c}
X & Y & \text{Intercept}\n\hline
0 & 3 & (0, 3) \\
2 & 0 & (2, 0) \\
\end{array}
\]

\[ 3x + 0 = 6 \]

\[ 3x = 6 \]

\[ x = 2 \]
\[ m = \frac{\text{rise}}{\text{run}} \]
Graph by plotting points:  $6x + 5y = 35$
$3x + 2y = 6$

<table>
<thead>
<tr>
<th>X</th>
<th>Y</th>
</tr>
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<tbody>
<tr>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>
Graph by plotting points: \[6x - 4y = 18\]
Graph $y = 4$

$m = 0$

\[
\frac{y - 4}{2 - 0} = \frac{0}{2 - 0} = 0
\]
Graph  $x = -2$  \(\text{no slope}\)
Graph $x = -2$

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</tr>
<tr>
<td>-2</td>
<td>4</td>
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</table>
Slope

Slope is rise over run

This chart gives the year and the average time spent by women in a supermarket.

<table>
<thead>
<tr>
<th>Year</th>
<th>Time Spent in Supermarket</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>32</td>
</tr>
<tr>
<td>1996</td>
<td>78.3</td>
</tr>
</tbody>
</table>

\[
\frac{78.3 - 32}{5} = \frac{46.3}{5} = 9.26 \text{ h/year}
\]
### Slope – Average Rate of Change

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</table>

\[
slope = \frac{\text{rise}}{\text{run}}
\]
Slope – Average Rate of Change

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<td>1996</td>
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</tbody>
</table>

\[
slope = \frac{\text{rise}}{\text{run}} = \frac{78.3 - 32}{1996 - 1991} = \frac{46.2}{5} = 9.3 \text{ hours/year}
\]
\[ 6x + 5y = 35 \]

\[
\frac{5y}{5} = -6x + 35
\]

\[
y = -\frac{6}{5}x + 7
\]

\[
y = mx + b
\]
Slope – Percent Change

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</tbody>
</table>

Percent Change = \( \left( \frac{\text{New} - \text{Old}}{\text{Old}} \right) \cdot 100 \)

\[
\frac{78.3 - 32}{32} = \frac{46.3}{32} = 1.44625 \\
144.625\% 
\]
Slope – Percent Change

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Percent Change = \left( \frac{\text{New}-\text{Old}}{\text{Old}} \right) \cdot 100

Percent Change = \left( \frac{78.3-32}{32} \right) \cdot 100

Percent Change = \left( \frac{46.3}{32} \right) \cdot 100

Percent Change = (1.447) \cdot 100

Percent Change = 144.7%
C = 0.41M + 21.95

Cost per Mile

<table>
<thead>
<tr>
<th>Miles</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>26.05</td>
</tr>
<tr>
<td>30</td>
<td>34.25</td>
</tr>
</tbody>
</table>

RATIO

\[
\frac{34.25 - 26.05}{30 - 10} = \frac{8.2}{20} = 0.41
\]
$C = 0.61M + 21.95$

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<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>28.05</td>
</tr>
<tr>
<td>30</td>
<td>40.25</td>
</tr>
</tbody>
</table>

RATIO

\[
\frac{40.25 - 28.05}{30 - 10} = \frac{12.2}{20} = 0.61
\]
GRAPHS OF THE FORM $Y = mX + b$

$Y = 5x + -5$
GRAPHS OF THE FORM $Y = mX + b$

$Y = 5x + 4$
GRAHS OF THE FORM $Y = mX + b$

$Y = 1 \times X + -5$