Mat 011 Agenda  Day 17: 10/11/02

- Attendance
- Return Quiz
- Review test Handout  PowerPoint Lecture 18
- Review test in textbook, S169

Homework:  Topic 18, pages S169
$3x + 2y = 12$

$x = 4$

$y = 6$

$(0, 6)$

$(4, 0)$
\[ y = 0.03x - 12 \]
\[ 0.03(100) - 12 = -9 \]
\[(3, -4)\] \(\text{and}\) \((-6, 10)\)

\[
\frac{-4 - 10}{3 - (-6)} = \frac{-14}{9}
\]

\[
\frac{10 - (-4)}{-6 - 3} = \frac{14}{-9}
\]
The graph to the right is the Dow Jones Industrial Average (DJIA) for Thursday, March 21, 1996.

What was the DJIA at 10:30 a.m.?
The graph to the right is the Dow Jones Industrial Average (DJIA) for Thursday, March 21, 1996.

When was the DJIA 5650 points?
The graph to the right is the Dow Jones Industrial Average (DJIA) for Thursday, March 21, 1996.

When was the DJIA 5650 points?

The Dow Jones was 5650 at 11, 12 and 3:30.
The graph to the right is the Dow Jones Industrial Average (DJIA) for Thursday, March 21, 1996.

When was the DJIA 5650 points?

The Dow Jones was 5650 at 11, 12 and 3:30.
The graph to the right is the Dow Jones Industrial Average (DJIA) for Thursday, March 21, 1996.

When was the DJIA reach its high point for the day?

What was the high point?
The graph to the right is the Dow Jones Industrial Average. When was the DJIA reach its high point for the day? The high was at 10 AM. What was the high point? The Dow Jones was 5675 at 10 AM.
The graph to the right is the Dow Jones. When was the Dow Jones reach its low point for the day?

What was the low point?
The graph to the right is the Dow Jones.
When was the Dow Jones reach its low point for the day?
The low was at 1:30 PM.
What was the low point?
The Dow Jones was 5625 at 1:30 PM.
The graph to the right is the Dow Jones Industrial Average (DJIA) for Thursday, March 21, 1996. When did the Dow Jones decrease the quickest?
The graph to the right is the Dow Jones Industrial Average. When did the Dow Jones decrease the quickest?

Dow Jones decreased 15 points between 10-10:30; 11:30 to 12; 12 to 12:30.
The graph to the right is the Dow Jones Industrial Average. Over what time period did the Dow Jones increase the quickest?
The graph to the right is the Dow Jones Industrial Average.
Over what time period did the Dow Jones increase the quickest?
Dow Jones increased 15 points between 11-11:30; 1:30 to 2; 3 to 3:30.
Find the percent increase.

\[ \% = \frac{\text{New} - \text{Old}}{\text{Old}} \]

\[ = \frac{3.4 - 1.6}{1.6} = \frac{1.8}{1.6} = 1.125 \]

1.125 decimal \( \Rightarrow \) 112.5 \%

\[ \text{Rate} = \frac{\text{Slope}}{\text{Time}} = \frac{1.8}{10} = 0.18 \text{ million cars} \rightarrow \text{Time} \]
\[ Y \cdot 1 \quad \$25 \quad \$36 \]

\[ \frac{36-25}{25} = \frac{11}{25} = .44 \]

\[ 44\% \]

Rate Change

\[ \frac{11}{3} \approx 3.6/\text{year} \]
Find the average rate of change.

<table>
<thead>
<tr>
<th>Year</th>
<th># of Cars Sold</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>1.6 million</td>
</tr>
<tr>
<td>1990</td>
<td>3.4 million</td>
</tr>
</tbody>
</table>
Graph using intercepts: \( y = \frac{-2}{3} x + 4 \)

To find the \( y \) intercept, let \( x = 0 \)

<table>
<thead>
<tr>
<th>X</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
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<table>
<thead>
<tr>
<th>( x )</th>
<th>( y )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( 0 )</td>
<td>( 0 )</td>
</tr>
</tbody>
</table>
\[ y = \frac{-2}{3} x + 4 \]
$y = \frac{-2}{3}x + 4$
Graph using intercepts

$21x + .03y = 46$
21x + .03y = 46

<table>
<thead>
<tr>
<th>X</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1533.3</td>
</tr>
<tr>
<td>2.2</td>
<td>0</td>
</tr>
</tbody>
</table>
The equation $21x + .03y = 46$ is graphed with points $(0, 1533.3)$ and $(2.2, 0)$.
Inequalities

Solve for $x$: $6 - 3x \leq 7$

\[
\begin{align*}
-6 & \quad -6 \\
\underline{-3x \leq 1} & \quad \underline{-3} \\
\frac{x}{-3} & \quad \frac{-1}{3} \\
x & \geq -\frac{1}{3}
\end{align*}
\]

$\left(-\frac{1}{3}, \infty\right)$: Inequality

Numberline: interval
Inequalities

Solve for $x$: $\ -2 < 4 + 3x \leq 10$

$\frac{-4}{-4} \quad -4$

$\frac{-6}{3} < \frac{3x}{3} \leq \frac{6}{3}$

$-2 < x \leq 2$

$(-2, 2]$
A person’s intelligence quotient (IQ) is determined by the formula  

\[ IQ = \frac{M \cdot 100}{A} \]

where \( M \) is the mental age (computed by taking a test) and \( A \) is the age of the person. A group of 15 year olds have an IQ range from 95 to 165. Find the range of the students’ mental age.

\[ 95 \leq IQ \leq 165 \]

\[ 15 \left(95\right) \leq \frac{15 \left(M \cdot 100\right)}{15} \leq 15 \left(165\right) \]

\[ 1425 \leq M \cdot 100 \leq 2475 \]

\[ 14.25 \leq M \leq 24.75 \]
Two companies, MONTCO and DELCO, offer very similar jobs. MONTCO pays $30,000 a year while DELCO pays $20,000 a year plus 10% commission.

\[ W_M = 30,000 \]
\[ W_D = 0.10 S + 20,000 \]
$WA = 30,000$

$WD = 0.10S + 20,000$

$WM \quad m = 0$

$0 \leq Sales \leq 100,000$

$Sales = 100,000$
Two companies, MONTCO and DELCO, offer very similar jobs. MONTCO pays $30,000 a year while DELCO pays $20,000 a year plus 10% commission. What do the y-intercepts mean?
Two companies, MONTCO and DELCO, offer very similar jobs. MONTCO pays $30,000 a year while DELCO pays $20,000 a year plus 10% commission. When does MONTCO pay more than DELCO?
$WM = 30,000$

$WD = 0.1S + 20,000$

Point: $(100,000, 30,000)$
Two companies, MONTCO and DELCO, offer very similar jobs. MONTCO pays $30,000 a year while DELCO pays $20,000 a year plus 10% commission.

What does the slope of each line mean in terms of the problem?