Mat 011: Agenda

- Review test: Handout
- PowerPoint Lecture
- Review test in textbook, p201
- Quiz #4: Graphing

Homework: Topic 18, p195
7x + 3y = 21

\[
\begin{array}{c|c}
7 & 0 \\
3 & 0
\end{array}
\]

\[
\begin{aligned}
0 + 3y &= 21 \\
3y &= 21 \\
y &= 7 \\
7x + 0 &= 21 \\
7x &= 21 \\
x &= 3
\end{aligned}
\]
$7x + 3y = 21$

<table>
<thead>
<tr>
<th>$x$</th>
<th>$y$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4.67</td>
</tr>
<tr>
<td>2</td>
<td>2.33</td>
</tr>
</tbody>
</table>

$x$-intercept $(x, 0)$

$7(2) + 3y = 21$
$14 + 3y = 21$
$14$ 

$y$-intercept $(0, y)$

$7 + 3y = 21$
$-7$

$3y = 14$
$3$

$y = 4.67$

$x = \frac{7}{3}$

$y = 2.33$
$7x + 3y = 21$

$y = \frac{-7}{3}x$

$m = -\frac{7}{3} = \frac{\text{rise}}{\text{run}}$
\[ 7x + 3y = 21 \]

\[ -7x \quad -7x \]

\[ 3y = 21 - 7x \]

\[ \frac{3y}{3} \quad \frac{21 - 7x}{3} \]

\[ y = 7 - \frac{7}{3}x \]
\[ y = 0.03x + 21 \]
#6 \( W_M = 30,000 \)

\( WD = 0.10(50,000 + 20,000) \)

\( \frac{10}{100} \)

\( W_{ages} \)

\( (0, 30,000), (0, 20,000) \)

\( 20,000 \quad 40,000 \)

\( M_D = 10 \)

\( (100,000, 30,000) \)

\( W_{other} \)

\( W_{M} = 0 \)
IQ = \frac{M}{A}

95 < IQ < 165

\frac{15(95)}{15} < M < \frac{15(165)}{15}

\frac{1425}{100} < M < \frac{2475}{100}

14.25 < M < 24.75

age

14.25 < 24.75 (14.25, 24.75)
$-2 \leq x < 3$

$[-2, 3)$
\[ y = -\frac{2}{3}x + 4 \]

<table>
<thead>
<tr>
<th>( x )</th>
<th>( y )</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>0</td>
</tr>
</tbody>
</table>

\[ 0 = -\frac{2}{3}x + 4 \]
\[ -4 = -\frac{2}{3}x \]
\[ \frac{-4}{-\frac{2}{3}} = x \]
\[ 6 = x \]
\[21x + 0.03y = 46\]

\[
\begin{array}{c|c}
  x & y \\
  \hline
  0 & 1533 \\
  2.19 & 0 \\
\end{array}
\]

\[0.03y = 46\]
\[y = 1533\]

\[\frac{21x}{21} = \frac{46}{21}\]
\[x = 2.19\]
%2

1980 1.6
1990 3.4

\[
\text{percent} = \frac{\text{new-old}}{\text{old}} = \frac{3.4-1.6}{1.6} = \frac{1.8}{1.6} = 1.125 \Rightarrow 112.5\% 
\]
\[
\text{Slope} = \text{average rate of change} \\
\begin{bmatrix}
1980 & 1.6 \\
1990 & 3.4
\end{bmatrix}
\]

\[
m = \frac{3.4 - 1.6}{1990 - 1980} = \frac{1.8}{10} = 0.18 \text{ million/ year}
\]

\[
\frac{1.6 - 3.4}{1980 - 1990} = \frac{-1.8}{-10} = 0.18
\]
\[21x + .03y = 46\]

\[-21x\]

\[.03y = 46 - 21x\]

\[.03 \cdot .03 \cdot .03 \cdot y = 1533 - 700x\]
\[ W_M = W_D \]

\[
30,000 = 0.10S + 20,000 \\
-20,000 \\
\hline
10,000 = 0.10S \\
\hline
\]

\# 10 \# 10

\[ 100,000 = S \]
$x = 6$

$m = \text{undefined}
\text{no slope}$

$\frac{x}{y} = \frac{6}{2}$

$(6, 0)$
$y = -5$

$m = 0$
Two companies, ACME and EMAC, offer very similar jobs. ACME pays $25,000 a year while EMAC pays $10,000 a year plus 10% commission.
Two companies, ACME and EMAC, offer very similar jobs. ACME pays $25,000 a year while EMAC pays $10,000 a year plus 10% commission.

Write the equation for the wages from ACME.

Let $W =$ Wages
$S =$ Sales
$WA = 25,000$

Write the equation for the wages from EMAC.

Let $W =$ Wages
$S =$ Sales
$WE = .10S + 10,000$
WA = 25,000
WE = 0.10S + 10,000

Sales

(0, 25000) (100,000, 25,000)
(50,000, 15,000)
(0, 10,000)
Two companies, ACME and EMAC, offer very similar jobs. ACME pays $25,000 a year while EMAC pays $10,000 a year plus 10% commission.

When do the two companies pay the same wages?
Two companies, ACME and EMAC, offer very similar jobs. ACME pays $25,000 a year while EMAC pays $10,000 a year plus 10% commission.

What do the y-intercepts mean?
Two companies, ACME and EMAC, offer very similar jobs. ACME pays $25,000 a year while EMAC pays $10,000 a year plus 10% commission.

When does ACME pay more than EMAC?
When does EMAC pay more than ACME?
Two companies, ACME and EMAC, offer very similar jobs. ACME pays $25,000 a year while EMAC pays $10,000 a year plus 10% commission.

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

<table>
<thead>
<tr>
<th>Year</th>
<th># of Cars Sold</th>
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<tbody>
<tr>
<td>1980</td>
<td>1.6 million</td>
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<tr>
<td>1990</td>
<td>3.4 million</td>
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Find the average rate of change.

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Graph using intercepts: \( y = \frac{-2}{3} x + 4 \)

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

<table>
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<tr>
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<tr>
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\[ y = -\frac{2}{3}x + 4 \]
$y = \frac{-2}{3}x + 4$

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Point (0, 4) and (6, 0) on the graph.
Graph using intercepts

\[21x + .03y = 46\]
$21x + .03y = 46$

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<tr>
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<td>1533.3</td>
</tr>
<tr>
<td>2.2</td>
<td>0</td>
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The equation given is $21x + .03y = 46$. The table shows points that satisfy the equation:

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The graph shows the line represented by this equation, with points $(0, 1533.3)$ and $(2.2, 0)$ plotted on it.
Inequalities

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

Solve for $x$: $-2 < 4 + 3x \leq 10$
A person’s intelligence quotient (IQ) is determined by the formula
\[
\text{IQ} = \frac{M \cdot 100}{A}
\]
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.
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.
WA = 30,000

Sales

100,000 200,000 300,000
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?
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?