Mat 011 Agenda Day 8 June 1, 2004

- Interpreting Graphs, PowerPoint Lecture 14
- Graphing Lines, PowerPoint Lecture 15
- Table of Values; Intercepts
- Quiz #3

Homework: Topic 14 p127, Topic 15 p139, p151
CPS system
A phone company charges 15 cents a minute plus 80 cents for the call. What is the equation that relates cost and minutes? Plot some points. Graph the equation.

<table>
<thead>
<tr>
<th>X</th>
<th>Y = .15X + .80</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>.15(0) + .80</td>
</tr>
<tr>
<td>5</td>
<td>.15(5) + .80</td>
</tr>
<tr>
<td>10</td>
<td>.15(10) + .80</td>
</tr>
<tr>
<td>15</td>
<td>.15(15) + .80</td>
</tr>
<tr>
<td>20</td>
<td>.15(20) + .80</td>
</tr>
</tbody>
</table>
(0, 80)
(10, 2, 30)

<table>
<thead>
<tr>
<th>X</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>80</td>
</tr>
<tr>
<td>5</td>
<td>155</td>
</tr>
<tr>
<td>10</td>
<td>230</td>
</tr>
<tr>
<td>15</td>
<td>305</td>
</tr>
<tr>
<td>20</td>
<td>380</td>
</tr>
</tbody>
</table>

minutes

-1
A phone company charges 15 cents a minute plus 80 cents for the call. What is the equation that relates cost and minutes? Plot some points. Graph the equation.

\[ Y = 0.15X + 0.80 \]
Sally has a lawn mowing business. She bought a lawn mower for $200 and she charges $5 an hour. What is the equation that relates profit and hours worked? Plot this equation using intercepts.

Let $h = \# \text{ hours}$

$P = \text{ profit}$

$f = 5h - 200$ Profit depending on hours

<table>
<thead>
<tr>
<th>$h$</th>
<th>$P$</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-200</td>
</tr>
<tr>
<td>10</td>
<td>-150</td>
</tr>
</tbody>
</table>
Sally has a lawn mowing business. She bought a lawn mower for $200 and she charges $5 an hour. What is the equation that relates profit and hours worked? Plot this equation using intercepts.

\[
C = 5h - 200
\]

<table>
<thead>
<tr>
<th>C</th>
<th>C=5h-200</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>h</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td></td>
</tr>
</tbody>
</table>
Break even point: (40, 0)

Fixed cost: (0, -200)

X intercept: (0, -200)

Y intercept: (10, 150)

The graph shows a linear relationship with the intercepts and points labeled as described.
Sally has a lawn mowing business. She bought a lawn mower for $200 and she charges $5 an hour. What is the equation that relates profit and hours worked? Plot this equation using intercepts.

\[
C = 5h - 200
\]
\[-2x > 8\]

\[-2 \cdot -2\]

\[x \leq -4\]

\[(-\infty, -4)\]

\[\leq\]

\[-4, 0\]
$5x + 7 \leq 2(x + 6)$

$\frac{5x + 7}{2x} \leq \frac{2x + 5}{2x}$

$5x \leq 2x + 5$

$3x \leq 5$

$x \leq \frac{5}{3}$

$x \leq 1.667$
\[-1 < 2x + 3 < 7\]

\[
\begin{align*}
-3 & \leq 2x \leq 4 \\
\frac{-3}{2} & \leq x \leq \frac{4}{2} \\
-2 & < x < \frac{4}{2}
\end{align*}
\]

\[-2 < x < 2\]

\[-2 \leq x \leq 2\]

\((-2, 2)\)
• Given a graph, determine zeros of a graph
• Given a graph, determine the critical regions of a graph
• Graph a line by plotting two points
The graph shows the temperature during a day in Chicago. What was the temperature at noon?
The graph shows the temperature during a day in Chicago. What was the temperature at noon?
The graph shows the temperature during a day in Chicago. When was the temperature 0°?

\( (1.5, 0) \quad (10, 0) \quad (18, 0) \)

1 AM, 10 AM, 6 PM
The graph shows the temperature during a day in Chicago. What was the high temperature for the day? When was the high temperature?
The graph shows the temperature during a day in Chicago.
What was the low temperature for the day?
When was the low temperature?

\((6, -31)\)
The graph shows the temperature during a day in Chicago. When was the temperature rising?
The graphs below show the profit for two companies, PA and HL. How many calculators does HL have to sell to break even? How many does PA have to sell to break even?
A repair shop charges $30 plus $15 per hour.

Write the equation that relates cost and hours.

Let \( h \) = # hours

\[ C = \text{cost} \]

\[ C = 15h + 30 \]

\[ \begin{array}{c|c|c}
  h & C \\
  \hline
  0 & 30 \\
  7 & 135 \\
\end{array} \]
A repair shop charges 30 plus $15 per hour.

\[ C = 15h + 30 \]

<table>
<thead>
<tr>
<th>h</th>
<th>C = 15h + 30</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>C = 15(0) + 30 = 30</td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>h</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>30</td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>
C = 15h + 30
$y = 3x - 4$

$x$-intercept:

$0 = 3x - 4$

$4 = 3x$

$x = \frac{4}{3}$

$1.333 = x$
Read

$2 \leq x < 3$

$[2, 3)$

$(2, 3)$

$2 < x < 3$

$2$

$3$
Graph by plotting points:  \[6x - 4y = 18\]

\[
\begin{array}{c|c}
 x & y \\
0 & 4.5 \\
3 & 0 \\
\end{array}
\]

\[
6x - 4y = 18
\]

\[
\begin{align*}
0 - 4y &= 18 \\
-4y &= 18 \\
y &= -4.5
\end{align*}
\]

\[
6x = 18
\]

\[
\frac{6x}{6} = \frac{18}{6}
\]

\[
x = 3
\]
Graph by plotting points: \(6x - 4y = 18\)

- Label the axes as \(x\) and \(y\).
- Plot the points \((0, -4.5)\) and \((3, 0)\).
- Draw a straight line through these points.
Graph by plotting points: $y = \frac{-1}{2} x + 5$

$\begin{array}{c|c|c|c|c|c}
 x & 0 & 2 & 4 & 6 \\
 y & -5 & 0 & 3 & 6 \\
\end{array}$

Equation: $0 = -5x + 5$

$-5 = -5x$

$10 = x$
Graph by plotting points: \(6x + 5y = 35\)
Graph using intercepts

$3x + 2y = 6$
$3x + 2y = 6$

<table>
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</thead>
<tbody>
<tr>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>
Graph \( x = -2 \)