Algebra 1 Unit 3

1. Students will be able to determine whether an ordered pair is a solution of an equation or a point on a line. They will be able to graph a line by making a table of values.
   Worksheet 1 1 - 10

2. Students will be able to find the slope and the y-intercept when given an equation. Be able to graph a line using the slope and y-intercept. (Section 5.2)
   Worksheet 2 1 - 12

3. Students will be able to determine the slope of a line from a graph or from two points. (Section 5.1)
   Page 234 1 - 26

4. Students will be able to re-write an equation into slope intercept form in order to graph the line. Graph vertical and horizontal lines. (Section 5.3)
   Worksheet 4 1 - 20

5. Students will be able to determine whether lines are parallel, perpendicular or neither. (Section 5.5)
   Worksheet 5 1 - 21

6. Students will be able to determine the x and y-intercepts and use them to graph a line. (Section 5.3)
   Worksheet 6 1 - 18

7. Students will be able to solve graphically a system of two linear equations in two variables. (Section 6.1)
   Page 276 1 - 14

Review Worksheet Review 1 1 - 41

Worksheet Review 2 1 - 24
Worksheet 1

In problems 1 - 5, complete the tables and plot the points. Connect the points with a straight line.

1. \( y = x + 4 \)

\[
\begin{array}{c|c|c}
 x & x+4 & (x,y) \\
-2 & 2 & \\
-1 & 1 & \\
0 & 0 & \\
1 & 5 & \\
\end{array}
\]

2. \( y = 2x - 3 \)

\[
\begin{array}{c|c|c}
 x & 2x-3 & (x,y) \\
-2 & -7 & \\
-1 & -5 & \\
0 & -3 & \\
1 & -1 & \\
\end{array}
\]

3. \( y = -3x + 1 \)

\[
\begin{array}{c|c|c}
 x & -3x+1 & (x,y) \\
-2 & 7 & \\
-1 & 4 & \\
0 & 1 & \\
1 & -2 & \\
\end{array}
\]

4. \( y = -\frac{1}{2}x - 1 \)

\[
\begin{array}{c|c|c}
 x & \frac{1}{2}x & (x,y) \\
-2 & -1 & \\
0 & 0 & \\
2 & 1 & \\
4 & 2 & \\
\end{array}
\]

5. \( y = \frac{3}{2}x + 1 \)

\[
\begin{array}{c|c|c}
 x & \frac{3}{2}x+1 & (x,y) \\
-2 & -1 & \\
0 & 1 & \\
2 & 3 & \\
4 & 5 & \\
\end{array}
\]
For problems 6 - 10 do not graph the lines. Show your work mathematically.

6. Determine whether the given point (2, 5) is a solution of the equation $y = 3x - 1$

7. Does the point (7, 1) lie on the line defined by $y = 2x + 5$?

8. Does the point (2, -3) lie on the line represented by the equation $3x - y = 3$?

9. Does the point $(3, -\frac{1}{5})$ lie on the line defined by $2x + 5y = 5$?

10. Does the point $(\frac{3}{4}, -1)$ lie on the line defined by $12x - y = 8$?
Worksheet 2

In problems 1 – 3, complete the tables, plot the points, connect the points with a straight line and then answer the questions.

1. \( y = 2x + 1 \)

<table>
<thead>
<tr>
<th>( x )</th>
<th>( 2x + 1 )</th>
<th>( y )</th>
<th>( (x, y) )</th>
</tr>
</thead>
<tbody>
<tr>
<td>-2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
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<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. \( y = \frac{1}{2}x - 3 \)

<table>
<thead>
<tr>
<th>( x )</th>
<th>( \frac{1}{2}x - 3 )</th>
<th>( y )</th>
<th>( (x, y) )</th>
</tr>
</thead>
<tbody>
<tr>
<td>-2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. \( y = -3x - 1 \)

<table>
<thead>
<tr>
<th>( x )</th>
<th>(-3x - 1)</th>
<th>( y )</th>
<th>( (x, y) )</th>
</tr>
</thead>
<tbody>
<tr>
<td>-2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-1</td>
<td></td>
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<td>1</td>
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</tr>
</tbody>
</table>

Question:

Where does this line cross the y-axis? _____

Where does this line cross the y-axis? _____

Where does this line cross the y-axis? _____

Question:

What is the slope of the line? ______

What is the slope of the line? ______

What is the slope of the line? ______
For problems 4 – 9, give the slope and $y$-intercept and graph the lines.

4. $y = 4x - 2$
   - $m = ____$
   - $b = ____$

5. $y = \frac{2}{3}x + 2$
   - $m = ____$
   - $b = ____$

6. $y = -2x + 1$
   - $m = ____$
   - $b = ____$

7. $y = -\frac{3}{4}x - 5$
   - $m = ____$
   - $b = ____$

8. $y = x + 3$
   - $m = ____$
   - $b = ____$

9. $y = 2x$
   - $m = ____$
   - $b = ____$
Select the correct multiple choice response:

10. Which best represents the graph of \( y = 2x + 1 \) ?

   A. 
   B. 
   C. 
   D. 

11. Which equation represents the line shown in the graph below?

   A. \( y = \frac{2}{3}x + 3 \)
   B. \( y = \frac{2}{3}x + 2 \)
   C. \( y = \frac{3}{2}x + 3 \)
   D. \( y = \frac{3}{2}x + 2 \)

12. Which equation best represents the graph below?

   A. \( y = x + 3 \)
   B. \( y = -x + 3 \)
   C. \( y = 3x \)
   D. \( y = -3x \)
Worksheet 4

For problems 1-6, get the 'y' by itself in the equation.
1. \(y + 2 = 4x\)  
2. \(6x + y = 4\)  
3. \(2y = 6x + 2\)  
4. \(-y = 5x - 7\)  
5. \(4x + 2y = 8\)  
6. \(3y - 6 = 9x\)

For problems 7 - 14 do the following:
a) Get the 'y' by itself in the equation. 
b) Give the slope 
c) Give the y-intercept 
d) Graph the line

7. \(y + 1 = -2x\)

\[
\begin{array}{c}
m = \\
b = \ \\
\end{array}
\]

8. \(3x + y = 2\)

\[
\begin{array}{c}
m = \\
b = \ \\
\end{array}
\]

9. \(-y = -x + 3\)

\[
\begin{array}{c}
m = \\
b = \ \\
\end{array}
\]

10. \(2y = 4x + 2\)

\[
\begin{array}{c}
m = \\
b = \ \\
\end{array}
\]
11. \(4x + 2y = 4\)  
   \[m = \underline{\hspace{2cm}}\]  
   \[b = \underline{\hspace{2cm}}\]  

12. \(2x + 3y = 6\)  
   \[m = \underline{\hspace{2cm}}\]  
   \[b = \underline{\hspace{2cm}}\]  

13. \(x + 4y = -8\)  
   \[m = \underline{\hspace{2cm}}\]  
   \[b = \underline{\hspace{2cm}}\]  

14. \(x - y = 4\)  
   \[m = \underline{\hspace{2cm}}\]  
   \[b = \underline{\hspace{2cm}}\]  

For problems 15 - 18 sketch the graphs:

15. \(y = 3\)  

16. \(x = -4\)  

17. \(x = 1\)  

18. \(x = -3\)  

19. \(y = -5\)  

20. \(y = -2\)
Worksheet 5

Find the slope of a line parallel to each of the following.
1.  \( y = \frac{1}{3}x - 6 \)
2.  \( y = 4x + 5 \)
3.  \( y = x + 2 \)
4.  \( 3x + 4y = 12 \)
5.  \( 5x - y = 3 \)
6.  \( 2x - 3y = 9 \)

Determine if the following lines are parallel.
7.  \( y = 4x + 6 \)
8.  \( y = 2x - 7 \)
9.  \( y = \frac{1}{3}x + 2 \)
2y = 8x - 1  
2x + y = 6  
x - 3y = 5

Find the slope of a line perpendicular to each of the following.
10. \( y = 4x \)
11. \( y = -6x + 1 \)
12. \( y = \frac{2}{7}x - 3 \)
13. \( 2x + 5y = 10 \)
14. \( 4x - y = 2 \)
15. \( x + 3y = 9 \)

Determine if the following lines are perpendicular.
16. \( y = -5x + 6 \)
17. \( 2y = 3x + 1 \)
18. \( y = \frac{1}{4}x - 2 \)
5y = x - 4  
3y = 2x + 5  
4x + y = 1

Tell whether the lines in each pair of equations are parallel, perpendicular or neither.
19. \( y = 4x + 7 \)
20. \( y = \frac{2}{3}x + 8 \)
21. \( y = 3x + 2 \)
\( y = 4x - 2 \)
\( 3x - 2y = 4 \)
\( 3x + y = 7 \)
Worksheet 6

Find the x- and y-intercepts of each equation.

1. \(x + 2y = 18\)  
2. \(3x - y = 9\)  
3. \(-5x + y = 30\)

4. \(-6x + 3y = -9\)  
5. \(4x + 12y = -18\)  
6. \(9x - 6y = -72\)

7. \(-2x - 3y = -12\)  
8. \(7x - 2y = 4\)  
9. \(-8x + 10y = 40\)

Match each equation with its graph.

10. \(2x - 5y = 10\)  
11. \(-2x + 5y = 10\)  
12. \(2x + 5y = 10\)

A.  
B.  
C.

Graph each equation using x- and y-intercepts.

13. \(x + y = 2\)  
14. \(x + y = -5\)  
15. \(x - y = -7\)

16. \(-3x + y = 6\)  
17. \(-2x + y = -6\)  
18. \(5x - 3y = 15\)
In problems 1 – 3 a system of equations has been graphed. State how many solutions each system has. Answer with one of the following multiple choice responses.

A. one solution  B. two solutions  C. no solution  D. an infinite number of solutions

1. 
2. 
3. 

1. Determine whether the point (0, 4) is a solution of \(3x + y = 4\).

2. Determine whether the point (1, -1) lies on the line \(x - y = 0\).

State the x and y-intercepts of each of the following.

3. \(x + 3y = 6\)  
4. \(-x + 2y = 4\)  
5. \(2x - 3y = -10\)

Graph the following using intercepts.

6. \(9x - 3y = 9\)  
7. \(2x + y = -6\)

Graph the following.

8. \(y = -4\)  
9. \(x = 5\)

Find the slopes, if they exist, of the lines containing these points.

10. \((6, 8), (-2, -4)\)  
11. \((5, 1), (3, 1)\)

12. \((2, 6), (2, -3)\)  
13. \((3, 4), (5, -8)\)

Find the slope and y-intercept of each of the following:

14. \(y = \frac{3}{5}x - 2\)  
15. \(y = -x + 5\)  
16. \(y = 6x\)

17. \(2y = 6x + 12\)  
18. \(3x + y = 8\)
Graph each line using the slope and y-intercept.

19. \( y = \frac{1}{2}x + 3 \)  
20. \( y = -3x + 1 \)  
21. \( 6y = 2x - 6 \)

In problems 22 - 30 state whether the slope of the line is: positive, negative, zero, or no slope.

22. \( x = 7 \)  
23. \( y = 2 \)  
24. 

25.  
26. a line with slope of \( \frac{0}{3} \)  
27. a horizontal line 

28.  
29. a vertical line  
30. 

Determine whether the lines below are parallel, perpendicular or neither.

31. \( y = 3x - 4 \)  
32. \( y = -2x + 7 \)  
33. \( y = -5x + 1 \)  
\( y = -3x + 2 \)  
\( y = \frac{1}{2}x - 6 \)  
\( 5x + y = 8 \)

Review 2

Select the correct multiple choice response.

1. Find the x-intercept of \( y = 2x - 8 \)
   A. -8   B. 4
   C. -4   D. 2

2. Find the x-intercept of \( 3x - 5y = 30 \)
   A. 3   B. -6
   C. -5   D. 10

3. Find the x-intercept of \( -4x = 6y + 12 \)
   A. -3   B. -2
   C. -4   D. 12

4. Find the y-intercept of \( 3y = 3x + 3 \)
   A. 3   B. -1
   C. 1   D. -3

5. Find the y-intercept of \( x - 2y = -10 \)
   A. 5   B. -5
   C. 10   D. -10
6. Find the slope of the line  \( y = 6x + 4 \)
   A. 4  B. 6  C. 1  D. -4

7. Find the slope of the line  \( 3y = 15x + 12 \)
   A. 15  B. 12  C. 4  D. 5

8. Find the slope of the line  \( 3x + 2y = 6 \)
   A. \(-\frac{3}{2}\)  B. -3  C. \(\frac{2}{3}\)  D. \(-\frac{2}{3}\)

9. Find the slope of the line passing through (1, 6) and (3, 1)
   A. \(\frac{2}{5}\)  B. \(-\frac{2}{5}\)  C. \(\frac{5}{2}\)  D. \(-\frac{5}{2}\)

10. Find the slope of the line passing through the points shown.
    A. \(\frac{2}{7}\)  B. \(-\frac{2}{7}\)  C. \(\frac{7}{2}\)  D. \(-\frac{7}{2}\)

14. What is the slope of a line parallel to the line  \( 5y = 5x + 20 \)
    A. 5  B. 20  C. 1  D. -1

15. Which line is parallel to the line  \( y = \frac{3}{5}x + 1 \)
    A.  \( y = \frac{3}{5}x + 2 \)  B.  \( y = -\frac{3}{5}x + 4 \)
    C.  \( y = \frac{5}{3}x + 6 \)  D.  \( y = -\frac{5}{3}x + 8 \)

16. What is the slope of a line perpendicular to the line  \( y = 6x - 8 \)
    A. 6  B. -6  C. \(\frac{1}{6}\)  D. \(-\frac{1}{6}\)
17. The equation of one line is \( y = 9x - 2 \).

The equation of a second line is \( y = -\frac{1}{9}x + 1 \)

Which statement is true about the two lines?
A. The two lines have the same y-intercept
B. The two lines are parallel
C. The two lines are perpendicular
D. The two lines have the same x-intercept

18. The equation of one line is \( 4x + 2y = 10 \)
The equation of a second line is \( y = -2x + 3 \)

Which statement is true about the two lines?
A. The two lines have the same y-intercept
B. The two lines are parallel
C. The two lines are perpendicular
D. The two lines have the same x-intercept

19. The equation of one line is \( y = 5x + 3 \)
The equation of a second line is \( y = 7x + 3 \)

Which statement is true about the two lines?
A. The two lines have the same y-intercept
B. The two lines are parallel
C. The two lines are perpendicular
D. The two lines have the same x-intercept

20. The equation of one line is \( y = 6x - 2 \)  \( \text{Call this line } l \)
The equation of a second line is \( y = 6x + 1 \)  \( \text{Call this line } q \)

Which statement is true about the two lines?
A. Lines \( l \) and \( q \) have the same y-intercept
B. Lines \( l \) and \( q \) are parallel
C. Lines \( l \) and \( q \) are perpendicular
D. Lines \( l \) and \( q \) have the same x-intercept

21. What is the slope of the line with the points shown in the table?

<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>7</td>
</tr>
</tbody>
</table>
22. What is the relationship between the two lines $y = \frac{2}{5}x + 1$ and $y = \frac{5}{2}x + 1$
A. The two lines are parallel
B. The two lines are perpendicular
C. The two lines are neither parallel or perpendicular

23. Which is the graph of the line $y = -\frac{1}{2}x + 3$

A.  
B.  
C.  
D.  

24. Which is the graph of $x = 2$

A.  
B.  
C.  
D.  

Algebra 1 Unit 3