ALGEBRA

Review w/ Answer Key

Quiz 4.1 to 4.3

Graphing in Slope-Intercept Form,
Writing Equations in Slope-Intercept Form,
Writing Equations in Point-Slope Form
4.1 Graphing Equations in Slope-Intercept Form

Write an equation of the line with the given slope and y-intercept.

1. slope: $\frac{1}{4}$, y-intercept: 3

2. slope: $\frac{3}{2}$, y-intercept: $-4$

3. slope: 1.5, y-intercept: $-1$

4. slope: $-2.5$, y-intercept: 3.5

Write an equation of the line shown in each graph.

6.

7.
Graph each equation. Rewrite in slope-intercept form if necessary.

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

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

Write a linear equation in slope-intercept form to model each situation.

11. A computer technician charges $75 for a consultation plus $35 per hour.

12. The population of Pine Bluff is 6791 and is decreasing at the rate of 7 per year.
4.2 Writing Equations in Slope-Intercept Form

Write an equation of the line that passes through each point with the given slope.

1. \( m = \frac{3}{1} \)

\[ y = \frac{3}{1}x \]

2. \( m = -2 \)

\[ y = -2x \]

Write an equation of the line that passes through each point with the given slope.

4. \((-5, 4), m = -3\)  
5. \((4, 3), m = \frac{1}{2}\)  
6. \((1, -5), m = -\frac{3}{2}\)
Write an equation of the line that passes through each pair of points.

7. \((2, -4), (4, -2)\)

8. \((0, 5), (4, 1)\)

Write an equation of the line that passes through each pair of points.

10. \((0, -4), (5, -4)\)

11. \((-4, -2), (4, 0)\)

16. \(x\)-intercept: 2, 
   \(y\)-intercept: -5
4.3 Writing Equations in Point-Slope Form

Write an equation of the line in point-slope form that passes through each point with the given slope.

1. \((2, 2), m = -3\)  
2. \((1, -6), m = -1\)

3. \((-3, -4), m = 0\)  
4. \((1, 3), m = -\frac{3}{4}\)

5. \((-8, 5), m = -\frac{2}{5}\)  
6. \((3, -3), m = \frac{1}{3}\)

Determine the slope and point shown in each equation.

12. \(y - 6 = \frac{4}{3}(x - 3)\)  
15. \(y - 4 = 2.5(x + 3)\)

11. \(y + 2 = -\frac{3}{4}(x + 1)\)  
18. \(y - 3 = -5(x + 12)\)
Write an equation in slope-intercept form.

7. \( y - 11 = 3(x - 2) \)  \hspace{1cm} 8. \( y - 10 = -(x - 2) \)

Write an equation in standard form.

16. \( y + 2 = 4(x + 2) \)  \hspace{1cm} 17. \( y + 1 = -7(x + 1) \)
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Quiz 4.1 to 4.3

Graphing in Slope-Intercept Form,
Writing Equations in Slope-Intercept Form,
Writing Equations in Point-Slope Form
4.1 Graphing Equations in Slope-Intercept Form

Write an equation of the line with the given slope and y-intercept.

1. slope: $\frac{1}{4}$, y-intercept: 3
   \[ m = \frac{1}{4} \quad b = 3 \]
   \[ y = \frac{1}{4}x + 3 \]

2. slope: $\frac{3}{2}$, y-intercept: $-4$
   \[ m = \frac{3}{2} \quad b = -4 \]
   \[ y = \frac{3}{2}x - 4 \]

3. slope: 1.5, y-intercept: $-1$
   \[ m = 1.5 \quad b = -1 \]
   \[ y = 1.5x - 1 \]

4. slope: $-2.5$, y-intercept: 3.5
   \[ m = -2.5 \quad b = 3.5 \]
   \[ y = -2.5x + 3.5 \]

Write an equation of the line shown in each graph.

6. 
   \[ m = \frac{3}{2} \quad b = 3 \]
   \[ y = \frac{3}{2}x + 3 \]

7. 
   \[ m = -\frac{2}{3} \quad b = -2 \]
   \[ y = -\frac{2}{3}x - 2 \]
Graph each equation. Rewrite in slope-intercept form if necessary.

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

9. \( \frac{3y}{3} = \frac{2x - 6}{3} \Rightarrow y = \frac{2}{3}x - 2 \)

Write a linear equation in slope-intercept form to model each situation.

11. A computer technician charges $75 for a consultation plus $35 per hour.

\[ y = 35x + 75 \]

12. The population of Pine Bluff is 6791 and is decreasing at the rate of 7 per year.

\[ y = -7x + 6791 \]
4.2 Writing Equations in Slope-Intercept Form

Write an equation of the line that passes through each point with the given slope.

1. \( m = 3 \) \( b = -1 \)
   
   \[ y = 3x - 1 \]

2. \( m = -2 \) \( b = -2 \)
   
   \[ y = -2x - 2 \]

Write an equation of the line that passes through each point with the given slope.

4. \((-5, 4), m = -3\)
   
   \[ y = mx + b \]
   
   \[ 4 = -3(-5) + b \]
   
   \[ 4 = 15 + b \]
   
   \[ 15 - 15 = -11 = b \]
   
   \[ y = -3x - 11 \]

5. \((4, 3), m = \frac{1}{2}\)
   
   \[ y = mx + b \]
   
   \[ 3 = \frac{1}{2}(4) + b \]
   
   \[ 3 = 2 + b \]
   
   \[ 2 - 2 = 1 = b \]
   
   \[ y = \frac{1}{2}x + 1 \]

6. \((1, -5), m = -\frac{3}{2}\)
   
   \[ y = mx + b \]
   
   \[ -5 = -\frac{3}{2}(1) + b \]
   
   \[ -5 = -1.5 + b \]
   
   \[ 1.5 + 1.5 = 3 = b \]
   
   \[ y = -\frac{3}{2}x - 3.5 \]
   
   \[ \text{or} \]
   
   \[ y = -\frac{3}{2}x - \frac{7}{2} \]
Write an equation of the line that passes through each pair of points.

7. \[ m = \frac{\frac{3}{2}}{2} = 1 \quad b = -6 \]
\[ y = 1x - 6 \]
\[ y = x - 6 \]

8. \[ m = -1 \quad y = 5 \]
\[ y = -1x + 5 \]
\[ y = -x + 5 \]

Write an equation of the line that passes through each pair of points.

<table>
<thead>
<tr>
<th>( x_1 )</th>
<th>( y_1 )</th>
<th>( x_2 )</th>
<th>( y_2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>10. ( 0, -4 ), ( 5, -4 )</td>
<td>( m = \frac{\frac{-4}{0}}{5 - 0} = \frac{-4}{5} )</td>
<td></td>
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<tr>
<td>[ m = 0 ]</td>
<td>[ y = mx + b ]</td>
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<td>[ y = 0x + b ]</td>
<td>[ y = 0(0) + b ]</td>
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<tr>
<td>[ y = -4 ]</td>
<td>[ -4 = 0 + b ]</td>
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<tr>
<td>[ b = -4 ]</td>
<td>[ y = -4 ]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

11. \( -4, -2 \), \( 4, 0 \) \[ m = \frac{\frac{0 - (-2)}{4 - (-4)}} = \frac{2}{8} \]
\[ m = \frac{1}{4} \]
\[ y = mx + b \]
\[ 0 = \frac{1}{4}(4) + b \]
\[ 0 = 1 + b \]
\[ -1 = -1 \]
\[ -1 = b \]
\[ y = \frac{1}{4}x - 1 \]

16. \( x \)-intercept: 2, \( y \)-intercept: -5
\[ (2, 0) \quad (0, -5) \]
\[ x_1 \quad y_1 \]
\[ x_2 \quad y_2 \]
\[ m = \frac{\frac{-5}{0}}{-2} = \frac{-5}{-2} = \frac{5}{2} \]
\[ y = mx + b \]
\[ 0 = \frac{5}{2}(2) + b \]
\[ 0 = 5 + b \]
\[ -5 = b \]
\[ y = \frac{5}{2}x - 5 \]
4.3 Writing Equations in Point-Slope Form

Write an equation of the line in point-slope form that passes through each point with the given slope.

1. \((2, 2), m = -3\)
   \[y - y_1 = m(x - x_1)\]
   \[y - 2 = -3(x - 2)\]

2. \((1, -6), m = -1\)
   \[y - y_1 = m(x - x_1)\]
   \[y - (-6) = -1(x - 1)\]
   \[y + 6 = - (x - 1)\]

3. \((-3, -4), m = 0\)
   \[y - y_1 = m(x - x_1)\]
   \[y - (-4) = 0(x - (-3))\]
   \[y + 4 = 0\]

4. \((1, 3), m = -\frac{3}{4}\)
   \[y - y_1 = m(x - x_1)\]
   \[y - 3 = -\frac{3}{4}(x - 1)\]

5. \((-8, 5), m = -\frac{2}{5}\)
   \[y - y_1 = m(x - x_1)\]
   \[y - 5 = -\frac{2}{5}(x - (-8))\]
   \[y - 5 = -\frac{2}{5}(x + 8)\]

6. \((3, -3), m = \frac{1}{3}\)
   \[y - y_1 = m(x - x_1)\]
   \[y - (-3) = \frac{1}{3}(x - 3)\]
   \[y + 3 = \frac{1}{3}(x - 3)\]

Determine the slope and point shown in each equation.

12. \(y - 6 = \frac{4}{3}(x - 3)\)
   \[m = \frac{4}{3} \quad (3, 6)\]

15. \(y - 4 = 2.5(x + 3)\)
   \[m = 2.5 \quad (-3, 4)\]

11. \(y + 2 = -\frac{3}{4}(x + 1)\)
   \[m = -\frac{3}{4} \quad (-1, -2)\]

18. \(y - 3 = -5(x + 12)\)
   \[m = -5 \quad (-12, 3)\]
Write an equation in slope-intercept form.

7. \( y - 11 = 3(x - 2) \)
   \[
   \begin{align*}
   &\text{1. Distribute} \quad y - 11 = 3x - 6 \\
   &\text{2. Isolate the } y \quad y = 3x + 5
   \end{align*}
   \]

8. \( y - 10 = -(x - 2) \)
   \[
   \begin{align*}
   &\text{1. Distribute} \quad y - 10 = -x + 2 \\
   &\text{2. Isolate the } y \quad y = -x + 12
   \end{align*}
   \]

Write an equation in standard form.

16. \( y + 2 = 4(x + 2) \)
   \[
   \begin{align*}
   &\text{1. Distribute} \quad y + 2 = 4x + 8 \\
   &\text{2. Isolate the } y \quad y = 4x + 6 \\
   &\text{3. Move the } x \quad -4x - y = 6 \\
   &\text{4. Multiply by negative 1 because the } A \text{ is negative} \quad -4x + y = 6
   \end{align*}
   \]

17. \( y + 1 = -7(x + 1) \)
   \[
   \begin{align*}
   &\text{1. Distribute} \quad y + 1 = -7x - 7 \\
   &\text{2. Isolate the } y \quad y = -7x - 8 \\
   &\text{3. Move the } x \quad +7x + y = -8 \\
   &\text{4. Same steps} \quad 7x + y = -8 \text{ done!}
   \end{align*}
   \]