One-Step Equations

Solve each equation.

1) $26 = 8 + v$

2) $3 + p = 8$

3) $15 + b = 23$

4) $-15 + n = -9$

5) $m + 4 = -12$

6) $x - 7 = 13$

7) $m - 9 = -13$

8) $p - 6 = -5$

9) $v - 15 = -27$

10) $n + 16 = 9$

11) $-104 = 8x$

12) $14b = -56$

13) $-6 = \frac{b}{18}$

14) $10n = 40$
Two-Step Equations

Solve each equation.

1) \(6 = \frac{a}{4} + 2\)

2) \(-6 + \frac{x}{4} = -5\)

3) \(9x - 7 = -7\)

4) \(6 = 4 + \frac{n}{5}\)

5) \(-4 = \frac{r}{20} - 5\)

6) \(-1 = \frac{5 + x}{6}\)

7) \(\frac{v + 9}{3} = 8\)

8) \(2(n + 5) = -2\)

9) \(-9x + 1 = -80\)

10) \(-6 = \frac{n}{2} - 10\)

11) \(-2 = 2 + \frac{v}{4}\)

12) \(144 = -12(x + 5)\)
Multi-Step Equations

Solve each equation.

1) $6a + 5a = -11$

2) $-6n - 2n = 16$

3) $4x + 6 + 3 = 17$

4) $0 = -5n - 2n$

5) $6r - 1 + 6r = 11$

6) $r + 11 + 8r = 29$

7) $-10 = -14v + 14v$

8) $-10p + 9p = 12$

9) $42 = 8m + 13m$

10) $c - 2 + 3 = -2$

11) $18 = 3(3x - 6)$

12) $30 = -5(6n + 6)$
Equations with Variables on Both Sides

Solve each equation, if possible. If there is no solution, write "no solution"; if it is the identity situation, write "all real numbers".

1) \(7m - 7 - 6m - 16 = 1 + 4m\) 

2) \(3 + 4n + n = 2n + 15\)

3) \(11 + 2p = p + 4\) 

4) \(-7k - 4k = 8 - 2k - 8k\)

5) \(-5 + 5(n - 7) = -40 + 5n\) 

6) \(8k - 6 = 6(k + 3) + 6k\)

7) \(6x + 1 = -6(1 - x)\) 

8) \(-8(1 + 4p) + 7p = -25 - 8p\)

9) \(4(3r + 4) = -8(2r + 5)\) 

10) \(2(-6m - 3) = 6(5m - 1)\)

11) \(\frac{19}{4} - \frac{3}{2}a = -\frac{1}{4}a + \frac{3}{2}\) 

12) \(\frac{61}{28} + a = \frac{19}{4}a - \frac{11}{7}\)
Find the slope of the line through each pair of points.

9) (8, 10), (−7, 14)     10) (−3, 1), (−17, 2)

11) (−20, −4), (−12, −10)  12) (−12, −5), (0, −8)

13) (−19, −6), (15, 16)     14) (−6, 9), (7, −9)

15) (−18, −20), (−18, −15)   16) (12, −18), (11, 12)

Find the slope of each line.

17) \( y = −5x − 1 \)     18) \( y = \frac{1}{3}x − 4 \)

19) \( y = −\frac{1}{5}x − 4 \)     20) \( x = 1 \)

21) \( y = \frac{1}{4}x + 1 \)     22) \( y = −\frac{2}{3}x − 1 \)

23) \( y = −x + 2 \)     24) \( y = −x − 1 \)

25) \( 2x + 3y = 9 \)     26) \( 5x + 2y = 6 \)
Finding Slope From Two Points

Find the slope of the line through each pair of points.

1) \((19, -16), (-7, -15)\)
2) \((1, -19), (-2, -7)\)
3) \((-4, 7), (-6, -4)\)
4) \((20.8), (9, 16)\)
5) \((17, -13), (17, 8)\)
6) \((19, 3), (20, 3)\)
7) \((3, 0), (-11, -15)\)
8) \((19, -2), (-11, 10)\)
Point-Slope Form

Write the slope-intercept form of the equation of each line.

1) \( y + 5 = \frac{7}{4}(x - 4) \)  
2) \( y + 4 = 2(x - 1) \)

3) \( y - 4 = \frac{4}{5}(x - 5) \)  
4) \( y + 3 = \frac{1}{5}(x - 3) \)

Write the point-slope form of the equation of the line through the given point with the given slope.

5) through: \((2, 3)\), slope = \(\frac{1}{4}\)  
6) through: \((-4, 1)\), slope = \(-\frac{1}{2}\)

7) through: \((-4, -4)\), slope = \(\frac{9}{4}\)  
8) through: \((2, -2)\), slope = \(-2\)

9) through: \((-4, -2)\), slope = 0

Write the point-slope form of the equation of the line through the given points.

10) through: \((-3, -3)\) and \((-5, 4)\)  
11) through: \((-5, 3)\) and \((0, 2)\)

12) through: \((4, -4)\) and \((4, 0)\)  
13) through: \((1, -3)\) and \((1, -5)\)
Point-Slope Form (Practice Worksheet)

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

1. (2, 7); m = -4  
2. (12, 5); m = -3  
3. (4, -5); m = 6

4. (-6, -2); m = 3  
5. (7, -6); m = $\frac{1}{2}$  
6. (-8, 2); m = $-\frac{3}{4}$

Graph the equations below.

7. $y + 4 = -3(x + 2)$  
8. $y + 3 = -2(x - 2)$  
9. $y - 1 = 3(x + 6)$  
10. $y + 4 = \frac{-5}{2}(x - 3)$

Write an equation in point-slope form of the line graphed below. (Use the right hand point)

11.  
12.  
13.  
14.

Write an equation in point-slope form of the line that passes through the two points given. Use the first point to write the equation.

15. (4, 7) and (5, 1)  
16. (9, -2) and (-3, 2)  
17. (3, -8) and 7(-2)
Finding the Slope

Formula: \( m = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1} \)

Example: \((4, 3)\) and \((8, 6)\)

\[
\begin{align*}
\text{rise} &= y_2 - y_1 \\
&= 6 - 3 \\
&= 3
\end{align*}
\]

\[
\begin{align*}
\text{run} &= x_2 - x_1 \\
&= 8 - 4 \\
&= 4
\end{align*}
\]

\[
m = \frac{3}{4}
\]

Use the given points to find the slope of the line.

\(a\) \((0, 0)\) and \((5, 2)\)

\[
\begin{align*}
\text{rise} &= \text{_____ - _____} \\
&= \text{_____} \\
\text{run} &= \text{_____ - _____} \\
&= \text{_____}
\end{align*}
\]

\[
m = \text{_____}
\]

\(b\) \((1, 2)\) and \((-3, 4)\)

\[
\begin{align*}
\text{rise} &= \text{_____ - _____} \\
&= \text{_____} \\
\text{run} &= \text{_____ - _____} \\
&= \text{_____}
\end{align*}
\]

\[
m = \text{_____}
\]

\(c\) \((5, 2)\) and \((6, 5)\)

\[
\begin{align*}
\text{rise} &= \text{_____ - _____} \\
&= \text{_____} \\
\text{run} &= \text{_____ - _____} \\
&= \text{_____}
\end{align*}
\]

\[
m = \text{_____}
\]
Extra Practice - Point-Slope and Slope-Intercept Form

Write the point-slope form of the equation of the line through the given point with the given slope.

1) through: \((4, -4)\), slope = -2
2) through: \((-5, 5)\), slope = 0

Write the point-slope form of the equation of the line through the given points.

3) through: \((-1, 4)\) and \((-4, 2)\)
4) through: \((-2, -3)\) and \((5, -3)\)

Write the point-slope form of the equation of each line given the slope and y-intercept.

5) Slope = 8, y-intercept = 5
6) Slope = -2, y-intercept = 5

Write the slope-intercept form of the equation of each line given the slope and y-intercept.

7) Slope = -5, y-intercept = 5
8) Slope = \(-\frac{4}{5}\), y-intercept = 0

Write the slope-intercept form of the equation of each line.

9) [Diagram of a line with x and y axes, passing through points.]
10) [Diagram of a line with x and y axes, passing through points.]