

Algebra 1, Week 2, Solving Equations (MUST SHOW ALL WORK TO GET CREDIT)

1. Solve the equation
- $2a - 6 + 5a = 3(a + 2) + 10$
- .

$$\begin{array}{r|l}
 \checkmark 2a - 6 + 5a & = 3a + 6 + 10 \\
 7a - 6 & = 3a + 16 \\
 -3a & \quad -3a \\
 \hline
 4a - 6 & = 16 \\
 +6 & \quad +6 \\
 \hline
 4a & = 22 \\
 \frac{4a}{4} & = \frac{22}{4} \\
 a & = \frac{11}{2}
 \end{array}$$

$$a = \frac{11}{2}$$

2. The equation
- $F = \frac{9}{5}C + 32$
- represents the relationship between
- F
- , temperature in Fahrenheit, and
- C
- , temperature in Celsius. If the Fahrenheit,
- $F = 104^\circ$
- , what is the temperature in Celsius?

$$\begin{array}{r|l}
 F & = \frac{9}{5}C + 32 \\
 104 & = \frac{9}{5}C + 32 \\
 -32 & \quad -32 \\
 \hline
 72 & = \frac{9}{5}C \\
 5(72) & = \left(\frac{9}{5}C\right)5 \\
 360 & = 9C \\
 \frac{360}{9} & \quad \frac{9C}{9} \implies 40 = C
 \end{array}$$

$$C = 40$$

3. Auto-Check Motors charged Mr. Jones \$81.00 for an automotive part plus \$68.00 per hour that a mechanic worked to install the part. The total charge was \$353.00. Write an equation and solve the equation for about how long the mechanic work to install the part on Mr. Jones's car?

$$\begin{array}{r|l}
 \text{Parts} + \text{Hrs} & = \text{Charge} \\
 81 + 68h & = 353 \\
 -81 & \quad -81 \\
 \hline
 68h & = 272 \\
 \frac{68h}{68} & \quad \frac{272}{68} \\
 h & = 4
 \end{array}$$

$$h = 4$$

4. Solve the equation $15 - 2x = -2(2x - 6) + 8x$

$$\begin{array}{r}
 15 - 2x = -4x + 12 + 8x \\
 15 - 2x = 4x + 12 \\
 \quad + 2x \quad \quad + 2x \\
 \hline
 15 = 6x + 12 \\
 -12 \quad \quad \quad -12 \\
 \hline
 3 = 6x \\
 \frac{3}{6} = \frac{6x}{6} \\
 \frac{1}{2} = x
 \end{array}$$

$$x = \frac{1}{2}$$

5. Rectangle ABCD has a length (L) represented by the expression $4x - 7$ and a width (W) represented by the expression $3x + 2$. The perimeter, $P = 74$. Find the value of x .

Hint: The perimeter, P of a rectangle is given by the formula $P = 2L + 2W$

$$\begin{aligned}
 P &= 74 \\
 L &= 4x - 7 \\
 W &= 3x + 2
 \end{aligned}$$

$$\begin{array}{r}
 P = 2L + 2W \\
 74 = 2(4x - 7) + 2(3x + 2) \\
 74 = 8x - 14 + 6x + 4 \\
 74 = 14x - 10 \\
 +10 \quad \quad \quad +10 \\
 \hline
 84 = 14x \\
 \frac{84}{14} = \frac{14x}{14} \\
 6 = x
 \end{array}$$

$$x = 6$$

6. Solve the equation $-3(2 + \frac{3}{2}n) = 12$

$$\begin{array}{r}
 -3(2 + \frac{3}{2}n) = 12 \\
 -6 - \frac{9}{2}n = 12 \\
 +6 \quad \quad \quad +6 \\
 \hline
 -\frac{9}{2}n = 18 \\
 2(-\frac{9}{2}n) = (18)2 \\
 -9n = 36 \\
 \frac{-9n}{-9} = \frac{36}{-9} \\
 n = -4
 \end{array}$$

7. Solve the equation, $-7(x-2) + 5(3-x) - 4x = -3x$

$$\begin{array}{r|l}
 \checkmark & \Delta \\
 -7x + 14 + 15 - 5x - 4x & = -3x \\
 \hline
 -16x + 29 & = -3x \\
 + 3x & \quad + 3x \\
 \hline
 -13x + 29 & = \phi \\
 -29 & -29 \\
 \hline
 -13x & = -29 \\
 \underline{-13} & \quad \underline{-13} \\
 x & = \frac{29}{13}
 \end{array}$$

$$x = \frac{29}{13}$$

8. Simplify the expression: $3.5a + 2(2.5 - 5b) + 5 - (2.5a + 4.6b) + 2.8b$

$$\begin{array}{r}
 \checkmark & \Delta & \checkmark & \Delta & \checkmark \\
 3.5a + .5 - 10b + .5 - 2.5a - 4.6b & + 2.8b \\
 (3.5a - 2.5a) + (.5 + .5) + (-10b - 4.6b + 2.8b) \\
 1a + 1 = 11.8b
 \end{array}$$

$$1a + 1 - 11.8b$$

9. Rectangle ABCD has a length (L) represented by $2x - 6$ and a width (W) represented by the expression $5x + 2$. Rectangle MNPQ has a length (L) represented by $-3x + 8$ and a width (W) represented by the expression $4x + 1$. Find the sum of the perimeters of Rectangle ABCD and Rectangle MNPQ..
Hint: The perimeter, P of a rectangle is given by the formula $P = 2L + 2W$

$$\begin{aligned}
 P_A &= 2(2x - 6) + 2(5x + 2) \\
 &= 4x - 12 + 10x + 4 \\
 &= 14x - 8
 \end{aligned}$$

$$\begin{aligned}
 P_m &= 2(-3x + 8) + 2(4x + 1) \\
 &= -6x + 16 + 8x + 2 \\
 &= 2x + 18
 \end{aligned}$$

$$\begin{array}{c}
 \text{SUM} \\
 P_A + P_m \\
 \hline
 14x - 8 + 2x + 18 \\
 \hline
 16x + 10
 \end{array}$$