

Bellwork: Algebra

1. Write down your work for the week in your planner.
2. You need your Algebra Nation book and a calculator.
3. Take out the work from Friday and be ready to check it.
4. Answer the following questions on your MONDAY bellwork sheet:

$$\frac{4}{3} \times \frac{x}{6}$$

$$\frac{24}{3} = \frac{3x}{3} \quad x=8$$

$$\frac{2n-10}{4} \times \frac{6n+7}{8}$$

$$8(2n-10) = 4(6n+7)$$

$$16n - 80 = 24n + 28$$

$$\begin{array}{r} -16n \quad -16n \\ \hline -80 = 8n + 28 \\ -28 \quad -28 \\ \hline -108 = 8n \\ n = \frac{-108}{8} \end{array}$$

$$\frac{n-4}{6} \times \frac{n-7}{9}$$

$$9(n-4) = 6(n-7)$$

$$9n - 36 = 6n - 42$$

$$\begin{array}{r} -6n \quad -6n \\ \hline 3n - 36 = -42 \end{array}$$

$$\begin{array}{r} +36 \quad +36 \\ \hline 3n = -6 \quad n = -2 \end{array}$$

$$8 \cancel{3} \left(\frac{2n-10}{4} \right) = 4 \left(\frac{6n+7}{8} \right)$$

$$\frac{3}{4} \times \frac{n-10}{2n+3}$$

$$4(n-10) = 3(2n+3)$$

$$4n - 40 = 6n + 9$$

$$\begin{array}{r} -4n \quad -4n \\ \hline -40 = 2n + 9 \\ -9 \quad -9 \\ \hline -49 = 2n \end{array}$$

$$\frac{-49}{2} = \frac{2n}{2}$$

$$n = -24.5$$

$$\begin{array}{r}
 1. \quad 2(n+2) = 4n + 1 - 2n \\
 2n + 4 = 2n + 1 \\
 \underline{-2n \quad -2n} \\
 4 \neq 1
 \end{array}$$

\emptyset

$$\begin{array}{r}
 2. \quad -15 - 3w = 4w - 2w \\
 -15 - 3w = 2w \\
 \underline{\quad +3w \quad +3w} \\
 -15 = 5w \\
 \underline{\quad \quad 5 \quad \quad 5} \\
 -3 = w
 \end{array}$$

$-3 = w$

$$\begin{array}{r}
 3. \quad 2(x+4) = 4x + 3 - 2x + 5 \\
 2x + 8 = 2x + 8 \\
 \underline{-2x \quad -2x} \\
 8 = 8
 \end{array}$$

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$$\begin{array}{r}
 4. \quad 4(2r-1) = -2(3r+16) \\
 8r - 4 = -6r - 32 \\
 \underline{+6r \quad \quad +6r} \\
 14r - 4 = -32 \\
 \underline{\quad +4 \quad \quad +4} \\
 14r = -28
 \end{array}$$

$r = -2$

$$\begin{array}{r}
 5. \quad 3a - 6a + 2 = 8a + 20 - 5a \\
 -3a + 2 = 3a + 20 \\
 \underline{+3a \quad \quad +3a} \\
 2 = 6a + 20 \\
 \underline{-20 \quad \quad -20} \\
 -18 = 6a
 \end{array}$$

$$\frac{-18}{6} = \frac{6a}{6}$$

$a = -3$

$$\begin{array}{r}
 6. \quad -(v+4) + 5 = 4v + 1 - 5v \\
 -v - 4 + 5 = -v + 1 \\
 -v + 1 = -v + 1 \\
 \underline{+v \quad \quad +v} \\
 1 = 1
 \end{array}$$

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$$7. 8 - 6m = 4m + 48$$

$$+6m \quad +6m$$

$$\begin{array}{r} 8 = 10m + 48 \\ -48 \quad -48 \\ \hline \end{array}$$

$$\begin{array}{r} -40 = 10m \\ \hline \frac{-40}{10} = \frac{10m}{10} \end{array}$$

$$m = -4$$

$$8. 11 + 3p - 7 = 6p + 5 - 3p$$

$$\begin{array}{r} 3p + 4 = 3p + 5 \\ -3p \quad -3p \\ \hline \end{array}$$

$$4 \neq 5$$

$$\emptyset$$

$$9. 4y = 38 - \frac{1}{2}(4y + 16)$$

$$4y = 38 - 2y - 8$$

$$4y = -2y + 30$$

$$\begin{array}{r} +2y \quad +2y \\ \hline \end{array}$$

$$\frac{6y}{6} = \frac{30}{6}$$

$$y = 5$$

$$10. 8x + 11 = 2(4x - 7) + 25$$

$$8x + 11 = 8x - 14 + 25$$

$$8x + 11 = 8x + 11$$

$$\begin{array}{r} -8x \quad -8x \\ \hline 11 = 11 \end{array}$$

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Sometimes you will be required to justify the steps to solve an equation. The following equation is solved for x . Use the properties to justify the reason for each step in the chart below.

Statements	Reasons
a. $5(x + 3) - 2 = 2 - x + 9$	a. Given
b. $5x + 15 - 2 = 2 - x + 9$	b. Distributive Property
c. $5x + 15 - 2 = 2 + 9 - x$	c. Commutative Property
d. $5x + 13 = 11 - x$	d. Equivalent Equation
e. $5x + 13 - 13 = 11 - 13 - x$	e. Subtraction property of equality
f. $5x = -2 - x$	f. Equivalent Equation
g. $5x + x = -2 - x + x$	g. Addition property of equality
h. $6x = -2$	h. Equivalent Equation
i. $\frac{6x}{6} = \frac{-2}{6}$	i. Division property of equality
j. $x = -\frac{1}{3}$	j. Equivalent Equation

A class is raising funds to go ice skating at the Rink at Campus Martius in Detroit. The class plans to rent one bus. It costs \$150.00 to rent a school bus for the day, plus \$11.00 per student for admission to the rink, including skates.

What is the variable in this situation?

$$s = \text{students}$$

Write an expression to represent the amount of money the school needs to raise.

$$150 + 11s$$

The class raised \$500.00 for the trip. Write an equation to represent the number of students who can attend the trip.

$$150 + 11s = 500$$

Solve the equation to determine the number of students who can attend the trip.

$$\begin{array}{r} 150 + 11s = 500 \\ -150 \qquad -150 \\ \hline \end{array}$$

$$\begin{array}{r} 11s = 350 \\ \hline 11 \qquad 11 \end{array}$$

$$s = 31.8$$

31 students

Let's Practice!

1. Consider the equation $2x - 3(2x - 1) = 3 - 4x$. Solve the equation for x . For each step, identify the property used to write an equivalent equation.

$$2x - 3(2x - 1) = 3 - 4x$$

$$2x - 6x + 3 = 3 - 4x$$

$$-4x + 3 = 3 - 4x$$

$$+4x$$

$$+4x$$

$$3 = 3$$

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Try It!

2. Consider the equation $3(4x + 1) = 3 + 12x - 5$. Solve the equation for x . For each step, identify the property used to convert the equation.

$$12x + 3 = 3 + 12x - 5 \quad 3 = -2$$

$$\begin{array}{r} 12x + 3 = 12x - 2 \\ -12x \quad -12x \end{array} \quad \emptyset$$

3. Brooklyn Technical High School surveyed its students about their favorite sports. The 487 students who listed soccer as their favorite sport represented 17 fewer students than three times the number of students who listed basketball as their favorite sport. Write and solve an equation to determine how many students listed basketball as their favorite sport.

$$\begin{array}{r} 487 = 3b - 17 \\ +17 \quad - \quad +17 \\ \hline 504 = 3b \\ \frac{504}{3} = \frac{3b}{3} \end{array} \quad b = 168 \text{ students}$$

1. The following equation is solved for x . Use the properties to justify the reason for each step in the chart below.

Statements	Reasons
a. $2(x + 5) - 3 = 15$	a. Given
b. $2x + 10 - 3 = 15$	b. Distributive Property
c. $2x + 7 = 15$	c. Equivalent Equation
d. $2x + 7 - 7 = 15 - 7$	d. Subtraction property of equality
e. $2x = 8$	e. Equivalent Equation
f. $\frac{2x}{2} = \frac{8}{2}$	f. Division property of equality
g. $x = 4$	g. Equivalent Equation