

## Bellwork: Algebra 1

1. Write down your homework for the night.
2. Take out your homework from yesterday and be ready to check.
3. You need your composition book and a calculator.
4. On your bellwork page for WEDNESDAY, answer the following:

Which equations have the solution set of  $\{\frac{1}{2}, -3\}$ ? Select all that apply.

$(4x - 2)(x + 3) = 0$

$$4x - 2 = 0$$

$$+2 \quad +2$$

$$x + 3 = 0$$

$$-3 \quad -3$$

~~$(x + \frac{1}{2})(x + 3) = 0$~~

$$4x = 2$$

$$x = -3$$

~~$(3x - 6)(3x - 6) = 0$~~

$$x = \frac{2}{4} = \frac{1}{2}$$

$(6x - 3)(4x + 12) = 0$

$$6x - 3 = 0$$

$$+3 \quad +3$$

$$4x + 12 = 0$$

$$-12 \quad -12$$

$(x - \frac{1}{2})(x + 3) = 0$

$$6x = 3$$

$$4x = -12$$

~~$(x - \frac{1}{2})(x - 3) = 0$~~

$$x = \frac{3}{6} = \frac{1}{2}$$

$$x = -3$$

~~$(4x + 2)(x + 3) = 0$~~

1. Solve the following equation using the zero product property.

$$(x + 8)(x + 11) = 0$$

$$x = -8 \quad x = -11$$

$$X = \{-11, -8\}$$

2. Solve the following equation using the zero product property.

$$(x + 9)(4x - 1) = 0$$

$$x = -9 \quad x = \frac{1}{4}$$

$$X = \left\{-9, \frac{1}{4}\right\}$$

3. Solve the following equation using the zero product property.

$$5(-v - 5) \cdot 3(v - 8) = 0$$

$$v = -5 \quad v = 8$$

$$X = \{-5, 8\}$$

4. Manny was given the equation  $(x + 2)(x - 17) = 0$  and asked to find the zeros. The solutions he came up with were  $x = 2$  and  $x = -17$ .

Are his solutions correct? Justify your answer.

**No.**  $x + 2 = 0$   
 $x = -2$

**$x$  should be equal to  $-2$  and  $17$ .**

5. Which equations have the same pair of solutions? Select all that apply.

- $(x + 6)(x - 6) = 0$   $6, -6$   
  $(x + 6)(x + 6) = 0$   
  $(x - 6)(x - 6) = 0$   
  $(2x + 12)(2x - 12) = 0$   $6, -6$   
  $(2x - 12)(x - 12) = 0$   
  $(x + 12)(x - 12) = 0$   
  $(x + 12)(x - 6) = 0$

6. Ted and Maggie solved the following equation,  $(3x - 2)(x + 5) = 0$ . Their work is shown below.

Ted

$$(3x - 2)(x + 5) = 0$$

$$3x - 2 = 0 \text{ or } x + 5 = 0$$

$$3x = 2 \text{ or } x = -5$$

$$x = \frac{2}{3} \text{ or } x = -5$$

Maggie

$$(3x - 2)(x + 5) = 0$$

$$3x - 2 = 0 \text{ or } x + 5 = 0$$

$$3x = -2 \text{ or } x = 5$$

$$x = -\frac{2}{3} \text{ or } x = 5$$

Who is correct? Correct the mistake in the incorrect work.

**Ted is correct. Maggie did not subtract five from both sides.**

## Using Algebra to Solve Word Problems

1

### DEFINE A VARIABLE

Use "**LET STATEMENTS**" to define your variable.

2

### SET UP EQUATION & SOLVE

Translate into an equation using your let statements. Then solve!

3

### DEFINE ANSWER

Give exactly what the problem is asking for.

### Set I: Finding Two Numbers

1. The larger of two numbers is four more than the smaller number. If the sum of the numbers is 74, find the numbers.

small:  $x$   
larger:  $x+4$

$$\text{small} + \text{large} = 74$$

$$x + x + 4 = 74$$

$$\begin{array}{r} 2x + 4 = 74 \\ -4 \quad -4 \\ \hline \end{array}$$

$$\frac{2x}{2} = \frac{70}{2}$$

$$\boxed{35, 39}$$

2. The larger of two numbers is seven less than three times the smaller number. If the sum of the numbers is 61, find the numbers.

small:  $x$   
larger:  $3x-7$

$$x + 3x - 7 = 61$$

$$4x - 7 = 61$$

$$\begin{array}{r} +7 \quad +7 \\ \hline \end{array}$$

$$4x = 68$$

$$x = 17$$

$$\boxed{17, 44}$$

3. The larger of two numbers is one more than four times the smaller number. If the sum of the numbers is 106, find the numbers.

small:  $x$   
larger:  $4x+1$

$$x + 4x + 1 = 106$$

$$5x + 1 = 106$$

$$\begin{array}{r} -1 \quad -1 \\ \hline \end{array}$$

$$5x = 105$$

$$x = 21$$

$$\boxed{21, 85}$$

4. The larger of two numbers is twice the smaller number. If 12 is subtracted from the larger number, the result is 7 more than the smaller number. Find the numbers.

Small:  $x$   
 larger:  $2x$

$$\begin{array}{r} 2x - 12 = x + 7 \\ -x \qquad -x \\ \hline x - 12 = 7 \\ +12 \quad +12 \end{array}$$

$$x = 19$$

$\boxed{19, 38}$

5. The highest score on an Algebra test was 42 points more than the lowest. When added together, the lowest and highest score was 154. Find both the highest and lowest score.

Small:  $x$   
 larger:  $x + 42$

$$\begin{array}{r} x + x + 42 = 154 \\ 2x + 42 = 154 \\ -42 \quad -42 \\ \hline 2x = 112 \end{array}$$

$$x = 56$$

$\boxed{56, 98}$

6. Garrett has one dollar less than three times as much money as Liz has. Together they have \$179. How much money does Garrett have?

7. The Buffalo Bills scored 24 more than twice the number of points that the Miami Dolphins scored. Altogether, the teams scored 66 points. How many did each team score individually?

8. There are 10 less red skittles than orange skittles in the bag. The orange skittles are also twice the number of red skittles. Find the number of red and orange skittles in the bag.

$$\begin{aligned} \text{red: } & X - 10 = 10 \\ \text{orange: } & X = 20 \end{aligned}$$

$$\begin{aligned} X &= 2(X - 10) & 0 &= X - 20 \\ & & +20 & \quad +20 \\ X &= 2X - 20 & 20 &= X \\ \hline -X & \quad -X & & \end{aligned}$$

**Set 2: Perimeter of a Rectangle**  $P = 2w + 2l$

9. The length of a rectangle is six inches more than its width. If the perimeter of the rectangle is 24 inches, find its dimensions.

width:  $x$

length:  $x + 6$

$$2x + 2(x + 6) = 24$$

$$2x + 2x + 12 = 24$$

$$4x + 12 = 24$$

$$4x = 12$$

$$x = 3 \text{ in}$$

$\boxed{3 \text{ in}, 9 \text{ in}}$

10. The length of a rectangle is five inches more than four times its width. If the perimeter of the rectangle is 90 inches, find its dimensions.

11. The length of a rectangle is three centimeters less than twice its width. If the perimeter of the rectangle is 18 centimeters, find its dimensions.

width:  $x$

length:  $2x - 3$

$$2x + 2(2x - 3) = 18$$