TWO-STEP EQUATIONS   *ANSWERS*

> YOU SHOULD ALREADY KNOW HOW TO SOLVE SIMPLE TWO-STEP EQUATIONS, BUT LET'S TAKE A LOOK AT SOME MORE DIFFICULT ONES.

> THE GOAL IS TO SEPARATE THE NUMBERS AND VARIABLES, BUT WHAT DO WE DO IF WE HAVE VARIABLES ON BOTH SIDES OF THE EQUATION?

> TAKE A LOOK AT THE EXAMPLE BELOW. IT HAS **4n** ON ONE SIDE AND **2n** ON THE OTHER, WHICH MEANS WE HAVE TO MOVE THE VARIABLE NOT THE NUMBER.

HELPFUL EXAMPLE

$$4n = 2n + 8$$

| THERE IS NO REASON TO MOVE THE PLUS 8 BECAUSE THERE ARE VARIABLES ON BOTH SIDES. |

1.
$$4n = 2n + 8$$
$$\underline{-2n \quad -2n}$$
$$2n = 0 + 8$$

| WE WILL NEED TO SEPARATE THE **2n** FROM THE PLUS 8. LET'S MOVE IT TO THE OTHER SIDE AND JOIN IT WITH THE OTHER VARIABLE. SINCE **2n** IS POSITIVE WE WILL NEED TO DO THE OPPOSITE OPERATION (-2n) TO BOTH SIDES. |

2.
$$2n = 8$$
$$\underline{\div 2 \quad \div 2}$$
$$1n = 4$$

| WE ARE LEFT WITH **2** AND **n** NEXT TO EACH OTHER, WHICH MEANS MULTIPLICATION. THE OPPOSITE OF MULTIPLICATION IS DIVISION, SO WE NEED TO DIVIDE BOTH SIDES BY 2. |

$$n = 4$$

| THE NUMBER AND VARIABLE ARE ON OPPOSITE SIDES, SO WE ARE FINISHED. **n = 4**. |

Now your turn. What would you move first?

1. $r + 10 = 6r$

FIRST I WOULD MOVE THE __*r*__ .

2. $8 - 4h = 2h$

FIRST I WOULD MOVE THE __**4h**__ .

3. $9 = 12 - 5p$

FIRST I WOULD MOVE THE __**12**__ .

Solve the equations.

4. $72 - 4n = 5n$

$n = 8$

5. $8k + 34 = 6k$

$k = -17$

6. $7f = 3f - 52$

$f = -13$

7. $4w = 45 - 11w$

$w = 3$

8. $56 - 3x = -91$

$x = 49$

9. $45 + 7d = 37d$

$d = 1.5$

10. $9s - 85 = -16s$

$s = 3.4$

11. $6g = 99 + 28g$

$g = -4.5$

12. $24 = 40 - \dfrac{v}{8}$

$v = 128$