

## 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.  $4n = 2n + 8$

$$\begin{array}{r} -2n \quad -2n \\ \hline 2n = 0 + 8 \end{array}$$

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.  $2n = 8$

$$\begin{array}{r} \div 2 \quad \div 2 \\ \hline 1n = 4 \end{array}$$

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.  $r + 10 = 6r$

2.  $8 - 4h = 2h$

3.  $9 = 12 - 5p$

FIRST I WOULD MOVE THE   $r$  .

FIRST I WOULD MOVE THE   $4h$  .

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.  $24 = 40 - \frac{v}{8}$

$$v = 128$$