

## TWO-STEP EQUATIONS

Finley and Drake each write an equation below. Finley says that both equations have a solution of  $x = 5$ . Drake says that is not true. Determine who is correct and justify your reasoning.

FINLEY

$$5x = 25$$

DRAKE

$$5x + 5 = 25$$

- ① add or subtract  
② multiply or divide

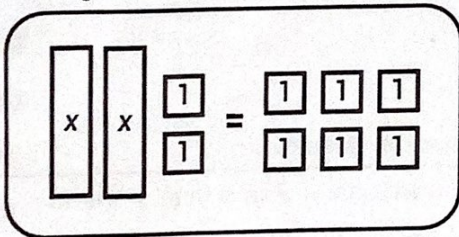
### STEPS TO SOLVE

1. Use inverse operations to undo addition and subtraction.
2. Use inverse operations to undo multiplication and division.
3. Solve the equation by isolating the variable

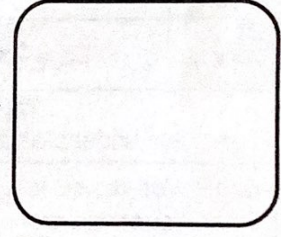
Ex.  $10x + 15 = 105$

$$\begin{array}{r} 10x + 15 = 105 \\ -15 \\ \hline 10x = 90 \\ \div 10 \\ \hline x = 9 \end{array}$$

Use algebra tiles to solve the equation modeled below.



$$\begin{array}{r} 2x + 2 = 6 \\ -2 \quad -2 \\ \hline 2x = 4 \\ \div 2 \quad \div 2 \\ \hline x = 2 \end{array}$$



Solve the following two-step equations. Draw algebra tiles if needed, and then check your work.

1.  $10 + 3k = 22$

$$\begin{array}{r} 10 + 3k = 22 \\ -10 \quad -10 \\ \hline 3k = 12 \\ \div 3 \\ \hline k = 4 \end{array}$$

CHECK & GRAPH:

2.  $19 = 4p - 5$

$$\begin{array}{r} 19 = 4p - 5 \\ +5 \quad +5 \\ \hline 24 = 4p \\ \div 4 \\ \hline p = 6 \end{array}$$

CHECK & GRAPH:

3.  $\frac{r}{2} - 8 = 16$

$$\begin{array}{r} \frac{r}{2} - 8 = 16 \\ +8 \quad +8 \\ \hline \frac{r}{2} = 24 \cdot 2 \\ \hline r = 48 \end{array}$$

CHECK & GRAPH:

4.  $7 = 2w - 3$

$$\begin{array}{r} 7 = 2w - 3 \\ +3 \quad +3 \\ \hline 10 = 2w \\ \div 2 \\ \hline 5 = w \end{array}$$

CHECK & GRAPH:

Solve the equations below for practice. Roll a pair of dice and find the sum of the two numbers showing. Solve that problem.

	SOLVE	SOLUTION
2	$4x - 8 = 32$	$x = 10$
3	$6x + 9 = 27$	$x = 3$
4	$x - 2.7 = 15.4$	$x = 18.1$
5	$\frac{2}{3}x + 10 = 16$	$x = 9$
6	$\frac{x}{6} + 2 = 16$	$x = 84$
7	$19 = 5 + 7x$	$x = 2$
8	$\frac{x}{3} - 14 = 9$	$x = 69$
9	$5.37 + x = 12.89$	$x = 7.52$
10	$42 = 6x - 24$	$x = 11$
11	$10x + 25 = 50$	$x = 2.5$
12	$58 = 7x - 5$	$x = 9$

SHOW WORK HERE:

Use your understanding of solving equations to answer the questions below.

5. JP was asked to place a check mark next to any equation in which  $x = 7$  is a true statement. Check over his work and correct any mistakes.

QUESTION #1

$8x - 15 = 41$

$x = 7$

QUESTION #2

$1.5x + 4 = 14.5$

$x = 7$

QUESTION #3

$2x + 12 = 2$

$x = -5$

Question 3  
does not = 7

6. Each of the students below made a statement about the equation,  $3x - 18 = 27$ . Which student(s) made a true statement?

**HANNAH**

The first step is to subtract 18 from both sides.

**AIYA**

To solve, add 18 to both sides and then divide by 3.

**ROMEO**

The solution is  $x = 15$  because  $3(15) - 18 = 27$ .

Summarize today's lesson: