

Solving Two-Step Equations

6th-7th grade



Standard – 6.EE.7

I can use expressions and equations to solve multi-step, real-life problems using positive and negative rational numbers.

Standard – 7.EE.3

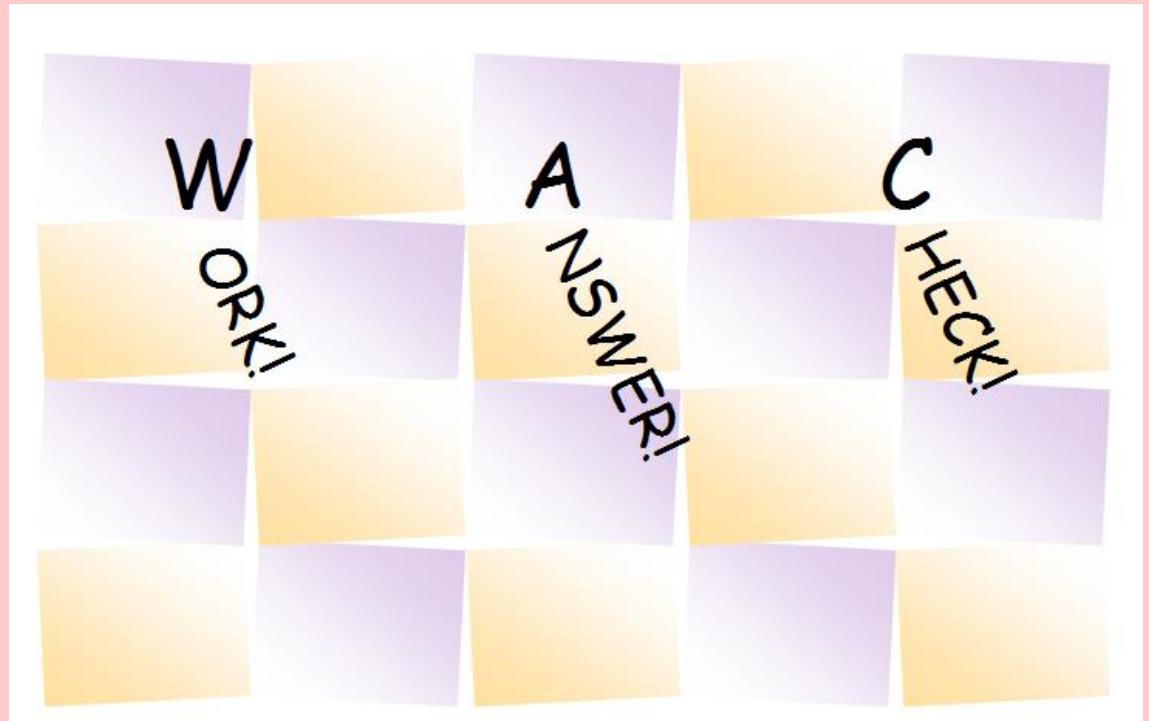
I can use expressions and equations to solve multi-step, real-life problems using positive and negative rational numbers.

What is a Two-Step Equation?

- Put in your own words
- **Two-Step Equation**: An equation that can be solved using two operations.

W. A. C.

- You can “WAC” these equations!
- Don't Forget...



Objective – Find the value of the variable by solving equations involving two steps.

$$3x + 4 = 16$$

Hard way

$$3x + 4 = 16$$



**- Undo Multiplication
or Division first**

Easy way

$$3x + 4 = 16$$

**- Undo Addition or
Subtraction first**

Hard way - Undo Mult./

Div. first

$$\frac{3x + 4}{3} = \frac{16}{3}$$

$$\cancel{\frac{3x}{3}} + \frac{4}{3} = \frac{16}{3}$$

$$x + \frac{4}{3} = \frac{16}{3}$$

$$- \frac{4}{3} \quad - \frac{4}{3}$$

$$x = \frac{12}{3}$$

$$x = 4$$

Easy way - Undo Add./

Subt. first

$$\begin{array}{r} 3x + 4 = 16 \\ -4 \quad -4 \\ \hline \end{array}$$

$$\frac{3x}{3} = \frac{12}{3}$$

$$x = 4$$




Two-Step Equations

- To undo Two Operations

USE “PEMDAS” IN REVERSE!!! (Undo It!)

Example:

$$3x + 1 = 7$$

P		S
E		A
M		D
D		M
A		E
S		P

Answer: $x=2$

You Try: $5 = 4a - 7$

$$5 + \frac{x}{8} = -3$$

Solve the following equations (WAC).

$$\begin{array}{r} 7) \quad 10 + 3x = 40 \\ -10 \qquad -10 \\ \hline 3x = 30 \\ 3 \qquad 3 \end{array}$$

$$x = 10$$

Check:

$$10 + 3(10) = 40$$

$$\begin{array}{r} 8) \quad 4 + 2x = 12 \\ -4 \qquad -4 \\ \hline 2x = 8 \\ 2 \qquad 2 \end{array}$$

$$x = 4$$

Check:

$$4 + 2(4) = 12$$

$$\begin{array}{r} 9) \quad 11 + \frac{x}{3} = 7 \\ -11 \qquad -11 \\ \hline \end{array}$$
$$\cancel{(3)} \frac{x}{3} = -4(3)$$

$$x = -12$$

Check:

$$11 + -12/3 = 7$$

$$\begin{array}{r} 10) \quad -6 + \frac{x}{7} = -2 \\ +6 \qquad +6 \\ \hline \end{array}$$

$$\cancel{(7)} \frac{x}{7} = 4(7)$$

$$x = 28$$

Check:

$$-6 + 28/7 = -2$$

Translate the sentence below and solve.

11) Five less than the quotient of x and 2 is 37.

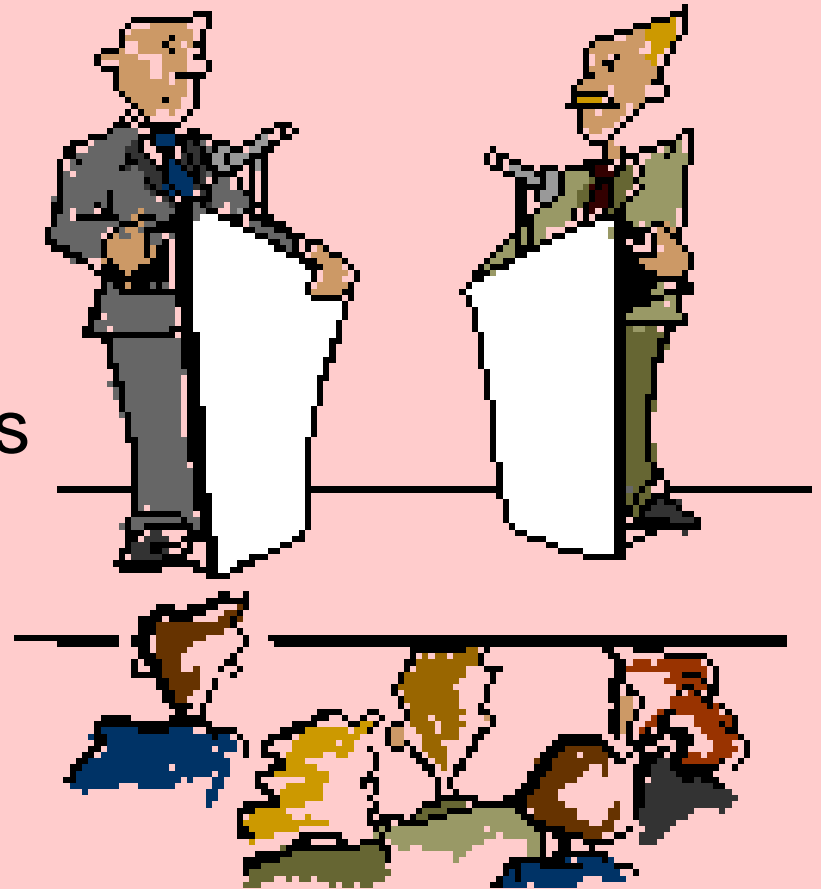
$$\begin{array}{r} \frac{x}{2} - 5 = 37 \\ +5 \quad +5 \\ \hline \end{array}$$

$$\cancel{(2)} \frac{x}{2} = 42(2)$$

$$x = 84$$

Quick Draw for Points!

- Who is the best at showing their work?
- The text is TWO STEP EQUATIONS
- You will have 30-60 seconds for each problem.
- Are you ready to prove yourself?



Solve the following equations (Remember, **WAC**).

$$1) 2x - 5 = 19$$

$$\begin{array}{r} +5 \quad +5 \\ \hline 2x = 24 \\ 2 \quad 2 \end{array}$$

$$x = 12$$

Check:

$$2(12) - 5 = 19$$

$$2) 8x + 1 = 25$$

$$\begin{array}{r} -1 \quad -1 \\ \hline 8x = 24 \\ 8 \quad 8 \end{array}$$

$$x = 3$$

Check:

$$8(3) + 1 = 25$$

$$3) 15 + \frac{x}{3} = 6$$
$$\begin{array}{r} -15 \quad -15 \\ \hline \end{array}$$

$$\cancel{(3)} \frac{x}{3} = -9(3)$$

Check:

$$15 + -27/3 = 6$$

$$x = -27$$

$$4) \frac{x}{5} - 4 = 3$$

$$\begin{array}{r} +4 \quad +4 \\ \hline \end{array}$$

$$\cancel{(5)} \frac{x}{5} = 7(5)$$

Check:

$$35/5 - 4 = 3$$

$$x = 35$$

Translate the sentence below and solve.

5) Eight more than 3 times a number y is the same as 29.

$$\begin{array}{r} 3y + 8 = 29 \\ -8 \quad -8 \\ \hline 3y = 21 \\ \hline 3 \quad 3 \\ y = 7 \end{array}$$

Check:

$$3(7) + 8 = 29$$

Distributive Property (solve for x):

6. $2(x + 5) = 20$

7. $6(4x + 4) = 48$

8. $2(10 + 3x) = 44$

9. $\frac{3}{4}(12x - 4) = 15$