

**8.EE.7 solve linear equations in one variable**

The balance below shows the equation  $4x+1=x+7$ . What is the value of  $x$ ?



$$\begin{aligned} -x & \quad -x \\ 3x+1 &= 7 \\ -1 & \quad -1 \\ 3x &= 6 \\ x &= 2 \end{aligned}$$

- A)  $8/5$     **B) 2**    C)  $8/3$     D) 3

If  $\frac{x+1}{x} = \frac{2}{3}$ , what is the value of  $x$ ?

$$\begin{aligned} x+1 &= \frac{2}{3}x \\ \frac{1}{3}x+1 &= 0 \\ -1 & \quad -1 \\ \frac{1}{3}x &= -1 \cdot 3 \\ \frac{1}{3} & \quad \frac{1}{3} \end{aligned}$$

- A)  $-\frac{2}{3}$**     B) -1    C) 1    D) 3

Solve the following equation for  $x$ .

$$\frac{1}{3}(18x+12) = -3x+40$$

- A)  $x = -21$     C)  $x = 12$   
**B)  $x = 4$**     D)  $x = 5$

$$\begin{aligned} 6x+4 &= -3x+40 & x=4 \\ +3x & \quad +3x & \\ 9x+4 &= 40 & 9x=36 \end{aligned}$$

Which of the following best describes the solution to the following equation?

$$-3x + \frac{1}{2}(6x+11) = -3.5$$

- A) One solution  $x = 3.5$   
 B) Infinitely Many Solutions  
**C) No Solutions**  
 D) One solution  $x = 5.5$

$$\begin{aligned} -3x+3x+11 &= -3.5 \\ 11 &\neq -3.5 \end{aligned}$$

Part A: Give an example of a linear equation to represent each type of solution set:

- A linear equation with exactly one solution

$$x+3=12$$

- A linear equation with infinitely many solutions

$$x+3=x+3$$

- A linear equation with no solutions

$$x+3=x+5$$

For each example, explain why the equation has that number of solutions.

$$\begin{aligned} x+3 &= 12 \\ -3 & \quad -3 \\ x &= 9 \\ \text{one sol.} & \end{aligned}$$

$$\begin{aligned} x+3 &= x+3 \\ -3 & \quad -3 \\ x &= x \\ \text{always true} & \end{aligned}$$

$$\begin{aligned} x+3 &= x+5 \\ -5 & \quad -5 \\ x-2 &= x \\ -x & \quad -x \\ -2 &\neq 0 \quad \text{Never true} \end{aligned}$$

Part B: What is the solution set for the equation  $3x+8+4x-3=9x-7-2x+8$ ? Show your work.

$$\begin{aligned} 7x+5 & \quad | \quad 7x+1 \\ -5 & \quad | \quad -5 \\ 7x &= 7x-4 \\ -7x & \quad -7x \\ 0 &= -4 \end{aligned}$$

Never true -  
 No solution.