

## Solving Equations

MGSE8.EE.7.a – Multi-Step Equations

MGSE8.EE.7.b – Equations with One, None, or Infinite Solutions

### Review Tips:

I. Equations with:

- i. *One solution*: Different on both sides [Example:  $x = 5$  or  $2x + 6 = 3x - 4$ ]
- ii. *Infinite Solution*: Same on both sides [Example:  $5 = 5$  or  $2x + 6 = 2x + 6$ ]
- iii. *No solution*: Same variable term, different constant [Example:  $5 = 6$  or  $3x + 5 = 3x - 2$ ]

II. *Distributive Property*: multiply all numbers in the group by the coefficient. [Example:  $4(x - 5) \rightarrow 4x - 20$ ]

III. *Combining Like Terms*: only terms with the same variable can be added or subtracted. [Example:  $4x + 3 - 2x \rightarrow 2x + 3$ ]

### Practice Problems:

❶ Which of the following equations will have **no solution** when simplified?

- A.  $3x - 4 = 5x + 2$       B.  $8x + 5 = 8x$       C.  $5x = 5x$       D.  $4x = 32$

❷ Find the value of  $x$ :  $4x + 2(x - 3) = 6x - 6$

- A.  $x = 0$       B.  $x = 6$       C. Infinite solutions      D. No solution

❸ Simplify the expression:  $\frac{1}{2}(4x + 6) = -5x + 24.7$

- A.  $x = 3.1$       B.  $x = 3$       C.  $x = 7$       D.  $x = -7.23$

❹ A student worked the following equation, showing his steps. In which step did he make a mistake?

- A. Step 1  
B. Step 2  
C. Step 3  
D. He made no error.

$$5(x - 3) - 2x = 5x - 11$$

[Step 1]  $\rightarrow 5x - 15 - 2x = 5x - 11$

[Step 2]  $\rightarrow 3x - 15 = 5x - 11$

[Step 3]  $\rightarrow -2x = 4$

[Step 4]  $\rightarrow x = -2$

❺ Find the value of  $x$ :  $\frac{x}{2} + 5 = 12$

- A.  $x = 14$       B.  $x = 7$       C.  $x = 34$       D. No solution

❻ Solve the equation for  $x$ :  $\frac{3}{4} + \frac{1}{2}x = x - \frac{1}{4}$

- A.  $x = \frac{1}{2}$       B.  $x = 5$       C.  $x = 1$       D.  $x = 2$

❼ Solve the equation for  $x$ :  $-10(x + 2) - 5x = -9x + 16$

- A.  $x = -6$       B.  $x = 6$       C.  $x = \frac{1}{6}$       D.  $x = \frac{3}{2}$