Day 3 – Justifying Steps of Equation Solving Practice

Directions: Identify each Property of Operations or Property of Equality.

1. $6 + 0 = 6$

Additive Identity

2. $4 \cdot 5 = 5 \cdot 4$

Commutative Prop of Multiplication

3. $4(x + 6) = 4x + 24$

Distributive Property

4. $\frac{1}{5} \cdot 5 = 1$

Multiplicative Inverse

5. $x - 4 + 4 = 5 + 4$

Addition Prop of =

6. If $-3 = y$, then $y = -3$

Symmetric Property

Directions: For each equation that has been solved, name the property that describes each step of the equation solving process.

7.

$5x + 15 = 75$	Given
$5x = 60$	*Subtraction Prop of =*
$x = 12$	*Division Prop of =*

8.

$\frac{t}{3} + 14 = 29$	Given
$\frac{t}{3} = 15$	*Subtraction Prop of =*
$t = 45$	*Multiplication Prop of =*

9.

$3(x - 2) = 12$	Given
$3x - 6 = 12$	*Distributive Prop*
$3x = 18$	*Addition Prop of =*
$x = 6$	*Division Prop of =*

10.

$3(x + 2) - 7 + 2x = 14$	Given
$3x + 6 - 7 + 2x = 14$	*Distributive Prop*
$5x - 1 = 14$	*Combine Like Terms*
$5x = 15$	*Addition Prop of =*
$x = 3$	*Division Prop of =*

11.

$3x + 15 - 9 = 2(x + 2)$	Given
$3x + 6 = 2(x + 2)$	*Combine Like Terms*
$3x + 6 = 2x + 4$	*Distributive Prop*
$x + 6 = 4$	*Subtraction Prop of =*
$x = -2$	*Subtraction Prop of =*

Solve each equation and determine if it has one solution, no solution, or infinite solutions.

12. $4(2x + 1) - 3(x - 2) = 10 + 5x$

$$8x + 4 - 3x + 6 = 10 + 5x$$
$$5x + 10 = 10 + 5x$$
$$\underline{-10 \quad -10}$$
$$\frac{5x}{5x} = \frac{5x}{5x}$$
$$1 = 1$$
$$\boxed{\text{Infinite Solutions}}$$

13. $10(x - 2) + 15 = 8x + 7$

$$10x - 20 + 15 = 8x + 7$$
$$10x - 5 = 8x + 7$$
$$\underline{-8x \qquad -8x}$$
$$2x - 5 = 7$$
$$\underline{+5 \quad +5}$$
$$\frac{2x}{2} = \frac{12}{2} \qquad \boxed{x = 6}$$

14. $x + 6(x - 1) = 7(3 + x)$

$$x + 6x - 6 = 21 + 7x$$
$$7x - 6 = 21 + 7x$$
$$\underline{-7x \qquad -7x}$$
$$-6 \neq 21$$
$$\boxed{\text{no Solution}}$$

15. $12x + 9 - 4x - 4 = 3x - 7 - x + 30$

$$8x + 5 \neq 2x + 23$$
$$\underline{-2x \qquad -2x}$$
$$6x + 5 = 23$$
$$\underline{-5 \quad -5}$$
$$\frac{6x}{6} = \frac{18}{6}$$
$$\boxed{x = 3}$$

✔

16. $3(3x + 4) - 2x - 5 - 7x = 20$

$$9x + 12 - 2x - 5 - 7x = 20$$
$$7 \neq 20$$
$$\boxed{\text{no Solution}}$$

17. $-9x + 12 + 4(3x - 3) = 7(x - 2) - 4x + 14$

$$-9x + 12 + 12x - 12 \neq 7x - 14 - 4x + 14$$
$$\frac{3x}{3x} = \frac{3x}{3x}$$
$$1 = 1$$
$$\boxed{\text{Infinite Solutions}}$$