

Solving Multi-Step Problems

- Recall that to solve an equation, isolate the variable (get it by itself) on one side of the equal sign.
- Use opposite operations to "undo" the operations performed on the variable. Examples of opposite operations are:
 - adding and subtracting
 - multiplication and division

* Note: Sometimes opposite operations are referred to as inverse operations.
- When isolating a variable, follow the reverse order of operations
 - ① Add and/or subtract
 - ② Multiply and/or divide
- Remember to do a left and right side check to verify your solution.

$$\text{Ex. 1) } 3x - 1 = 8$$

$$\frac{3x}{3} = \frac{9}{3}$$

$$\boxed{x = 3}$$

LS	RS
$3x - 1$	8
$3(3) - 1$	
$9 - 1$	
8	

✓

$$\text{Ex. 2) } -17 = 6x + 1$$

$$\frac{-18}{6} = \frac{6x}{6}$$

$$\boxed{-3 = x}$$

LS	RS
-17	$6x + 1$
	$6(-3) + 1$
	$-18 + 1$
	-17

✓

$$\text{Ex. 3)} \quad \frac{d}{7} - 5 = 3$$

$$\quad \quad \quad +5 \quad +5$$

$$7 \frac{d}{7} = 8(7)$$

$$\boxed{d = 56}$$

LS	RS
$\frac{d}{7} - 5$	3
$\frac{56}{7} - 5$	
$8 - 5$	
3	

$$\text{Ex. 4)} \quad -2 = \frac{p}{-3} + 4$$

$$(-3) \cdot -6 = \frac{-3P}{-3}$$

$$\boxed{18 = P}$$

LS	RS
-2	$\frac{P}{-3} + 4$
	$\frac{18}{-3} + 4$
	$-6 + 4$
	-2

Assignment

Following the steps outlined, solve the following equation. Do on a separate sheet of paper. Be sure to show all work and include a left and right side check.

1. $4r - 2 = 14$

5. $29 = -14n + 1$

2. $-3 = 7 + \frac{n}{5}$

6. $2 + \frac{m}{3} = 18$

3. $\frac{p}{-5} + 3 = -2$

7. $8x - 7 = -31$

4. $2g + 4 = -6$

8. $-2 = \frac{n}{13} - 17$