Bell Ringer - Solve the equations.

1) $4w - w + 26 = 19$

2) $\frac{1}{3}n + 16 = -4$

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1) $4w - w + 26 = 19$

$$3w + 26 = 19$$
$$-26 \quad -26$$
$$\frac{3w}{3} = \frac{-7}{3}$$
$$w = \frac{-7}{3} \text{ or } -2\frac{1}{3}$$

2) $\frac{1}{3}n + 16 = -4$

$$-16 \quad -16$$
$$\frac{3}{1} \cdot \frac{1}{3}n = \frac{-20}{1} \cdot \frac{3}{1}$$
$$n = -60$$

Solving Equations with Variables on Each Side

Steps:

1) Decide which side you want to have contain the variables.

2) Move the variable terms to that side by addition/subtraction.

   - note: cannot combine like terms across the equals sign.

3) Move the non-variable terms to the other side.

4) Using steps 2 and 3 solve the equation by isolating the variable.

    - handle parentheses first

    - addition/subtraction second

    - multiplication/division third

Consider
- integer rules
- leave, change, opposite

Solve.   1) 5x + 12 = 2x

Variable on left.   Variable on right.

5x + 12 = 2x   5x + 12 = 2x

Solve.   1) $5x + 12 = 2x$

Variable on left.

$5x + 12 = 2x$

$-2x \quad\quad -2x$

$3x + 12 = 0$

$\quad -12 \quad -12$

$\dfrac{3x}{3} = \dfrac{-12}{3}$

$x = -4$

Variable on right.

$5x + 12 = 2x$

$-5x \quad\quad -5x$

$\dfrac{12}{-3} = \dfrac{-3x}{-3}$

$-4 = x$

Solve.　　2)　1.4n - 6 = 2.9n + 9

Variable on left.　　　　　　　Variable on right.

1.4n - 6 = 2.9n + 9　　　　　　1.4n - 6 = 2.9n + 9

Solve.   2) $1.4n - 6 = 2.9n + 9$

Variable on left.   Variable on right.

$1.4n - 6 = 2.9n + 9$ $1.4n - 6 = 2.9n + 9$

$$-2.9n \qquad -2.9n$$

$$-1.5n - 6 = 9$$

$$+6 \quad +6$$

$$-1.5n = 15$$

$$\overline{-1.5} \quad \overline{-1.5}$$

$$n = -10$$

$$-1.4n \qquad -1.4n$$

$$-6 = 1.5n + 9$$

$$-9 \qquad\qquad -9$$

$$\frac{-15}{1.5} = \frac{1.5n}{1.5}$$

$$-10 = n$$

Solve.   3) -3.8n + 4 = 4.4n - 37

Variable on left.   Variable on right.

-3.8n + 4 = 4.4n - 37   -3.8n + 4 = 4.4n - 37

Solve.   3) -3.8n + 4 = 4.4n - 37

Variable on left.

-3.8n + 4 = 4.4n - 37

$-4.4n \qquad\qquad -4.4n$

$-8.2n + 4 = -37$

$\qquad -4 \quad -4$

$$\frac{-8.2n}{-8.2} = \frac{-41}{-8.2}$$

$$n = 5$$

Variable on right.

-3.8n + 4 = 4.4n - 37

$+3.8n \qquad\qquad +3.8n$

$4 = 8.2n - 37$

$+37 \qquad\qquad +37$

$$\frac{41}{8.2} = \frac{8.2n}{8.2}$$

$$5 = n$$

Solve.   4) $-\frac{1}{3}x + \frac{5}{6}x + 2 = -\frac{1}{2} + \frac{1}{6}x$

Variable on left.

Solve. 4) $-\frac{1}{3}x + \frac{5}{6}x + 2 = -\frac{1}{2} + \frac{1}{6}x$

Variable on left.

$$-\frac{2}{6}x + \frac{5}{6}x + 2 = -\frac{1}{2} + \frac{1}{6}x$$

$$\frac{3}{6}x + 2 = -\frac{1}{2} + \frac{1}{6}x$$

$$-\frac{1}{6}x \qquad\qquad -\frac{1}{6}x$$

$$\frac{2}{6}x + 2 = -\frac{1}{2}$$

$$\qquad -2 \quad -2$$

$$\frac{2}{6}x = -2\frac{1}{2}$$

$$\frac{6}{2} \cdot \frac{2}{6}x = -\frac{5}{2} \cdot \frac{6}{2}$$

$$x = -\frac{30}{4} = -\frac{15}{2}$$