NOTES: Sections 3.4 – Solving Equations with Variables on **Both Sides**

Goals: #1 - I can solve equations that have variables on both sides.







Homework: Section 3.3 - 3.4 Worksheet

Warm Up:

Solve the following equations.

a.
$$\frac{5(6+j)}{5} = \frac{45}{5}$$

 $6+j=9$
 $-6-6$

b.
$$5w + 2w - 7 = 70$$

 $7W - 7 = 70$
 $+7 + 7$
 $7W - 77$
 $[W - 11]$

$$\frac{4}{3} c \left[\frac{4}{3} (x+6) \right] = \begin{bmatrix} 12 \end{bmatrix} \frac{4}{3}$$

$$\times + b = 1b$$

$$-b = -b$$

$$\times = 10$$

Exploration #1:

Combine all the like terms and simplify the expression:

a.
$$3x^2 + 4 - x - 2x + 5x^3$$

 $5x^3 + 3x^2 - 3x + 4$

b.
$$3(x+2)+4x-x^2$$

 $3x+6+4x-x^2$
 $-x^2+7x+6$

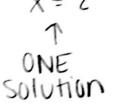
Notes:

Solving linear equations may require more than _0 \(\text{\text{\$\lambda\$}} \). step.

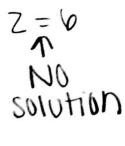
Some equations have variables on <u>Votto</u> sides. To solve these equations, we are going to _____ all our variable terms on one side of the equation.

Linear equations have _____ solution, _____ solutions, OR _____ solution.

Example:



d=d TUAM solutions solution (identity)



Example #1: Solve the following equations.

1.
$$7x + 19 = -2x + 55$$

 $+2x$
 $+2x$
 $-19 = 55$
 $-19 = -19$
 $-19 = -19$
 $-19 = -19$
 $-19 = -19$
 $-19 = -19$
 $-19 = -19$

Check:
$$7(4) + 19^{\frac{7}{2}} - 2(4) + 55$$
 $28 + 19^{\frac{7}{2}} - 8 + 55$
 $47 - 47 \checkmark$

2.
$$80 - 9y = 6y + 9y + 9y + 9y + 15y = 1$$

Check:
$$80-9(\frac{18}{3}) = 10(\frac{18}{3})$$

 $80-48 = 32$
 $32-32$

You practice: Solve the following equations.

1.
$$5y-2=y+10$$

 $-y$ $-y$
 $4y-2=10$
 $+z$ $+z$
 $4y=12$
 4 $y=3$

2.
$$-6x + 4 = -8x + 6x + 6x + 6x$$

$$4 = -2x - 2$$

$$-2 - 2$$

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Example #2: Solve the following equations.

1.
$$3x-10+4x=5x-7$$

 $7x-10=5x-7$
 $-5x$
 $-5x$
 $2x=3$
 $2x=3$
 $2x=3$
 $2x=3$
 $2x=3$
 $3(\frac{3}{2})-10+4(\frac{3}{2})=5(\frac{3}{2})-7$
 $2x-10=-7$
 $2x=3$
 $2x=3$

7
$$\frac{2x=3}{2}$$
 CMCV:
 $3(\frac{3}{2})-10+4(\frac{3}{2})=5(\frac{3}{2})-7$
 $2(\frac{3}{2})-10+6=\frac{15}{2}-7$
 $\frac{1}{2}=\frac{1}{2}$

2.
$$3(x+2) = 3x+6$$

$$3x + b = 3x + 6$$

$$-3x - 3x$$

$$6 = 6$$

$$many solutions - identity$$

3.
$$3(x+2)=3x+4$$

 $3x+b=3x+4$
 $-3x$
 $0 \neq 4$
NO SOLUTION

You practice: Solve the following equations.

(0

1.
$$5x - 3x + 4 = 3x + 8$$

 $2x + 4 = 3x + 8$
 $-2x - 2x$
 $4 = x + 8$
 $-8 - 8$
 $-4 = x$

2.
$$2(x+4) = 2x-8$$

 $2x + 8 = 2x - 8$
 $-2x - 7x$
 $8 + - 8$
NO solution

CHALLENGE: Solve the equation: 7 - (-4t) = 4t - 14 - 21t $7 + 4t = 4t - 14 - 21^{t}$ $\frac{21t}{21} = -\frac{21}{21}$ 7 + 4t = -17t - 14 $\frac{21}{21} = \frac{-21}{21}$ 7+4t=-17t-14 +17t +17t t=-1

7+71t = -14