Name Key

Date

Math 8A

2.4 CW

Solving Equations with Variables on Both Sides
Classwork

Aim: *How can we determine the solution of an equation with variables on both sides?*

Warm Up: Solve the following equations

(a) $3(x-2)-3=4+\frac{1}{2}(12x+14)$

$3x-6-3=4+6x+7$

$3x-9=11+6x$

$+9 \quad +9$

$3x=20+6x$

$-3x \quad -3x$

$-3x=20$

$\frac{-3x}{-3}=\frac{20}{-3}$

$x=-\frac{20}{3}$

(b) $5-2(x-10)=50$

$5-2x+20=50$

$-2x+25=50$

$-25 \quad -25$

$-2x=25$

$\frac{-2x}{-2}=\frac{25}{-2}$

$x=-\frac{25}{2}$

Guided Practice:

Exercise 1- Solve the following equations

I Do:

$6x-3(x-1)=4(2x+1)$

$6x-3x+3=8x+4$

$3x+3=8x+4$

$-3x \quad -3x$

$3=5x+4$

$-4 \quad -4$

$-1=5x$

$\frac{-1}{5}=\frac{5x}{5}$

$x=-\frac{1}{5}$

You Try:

$3(x-1)-(4x+2)=9(x+3)$

$3x-3-4x-2=9x+27$

$-x-5=9x+27$

$+x \quad +x$

$-5=10x+27$

$-27 \quad -27$

$-32=10x$

$\frac{-32}{10}=\frac{10x}{10}$

$x=-\frac{16}{5}$

Exercise 2- Solve the following equations (Proportions)

I Do:

$\frac{x-6}{9}=\frac{x+9}{4}$

$4(x-6)=9(x+9)$

$4x-24=9x+81$

$-4x \quad -4x$

$-24=5x+81$

$-81 \quad -81$

$-105=5x$

$\frac{-105}{5}=\frac{5x}{5}$

$x=-21$

You Try:

$\frac{7}{2x-8}=\frac{3}{x-6}$

$7(x-6)=3(2x-8)$

$7x-42=6x-24$

$-6x \quad -6x$

$x-42=-24$

$+42 \quad +42$

$x=18$

Exercise 3- Solve the following equations (with Multiplying Polynomials)

I Do:

$x(x-9) = (x+3)(x-8)$

$x^2 - 9x = x^2 - 8x + 3x - 24$

$x^2 - 9x = x^2 - 5x - 24$

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

$-9x = -5x - 24$

$+5x \quad +5x$

$-4x = -24$

$\frac{-4x}{-4} = \frac{-24}{-4}$ $\quad x = 6$

You Try:

$(2x-5)(3x-2) = 3x(2x-6)$

$6x^2 - 4x - 15x + 10 = 6x^2 - 18x$

$6x^2 - 19x + 10 = 6x^2 - 18x$

$-6x^2 \quad -6x^2$

$-19x + 10 = -18x$

$+19x \quad +19x$

$10 = x$

Problem Set: Solve the following for questions then complete **"solving equations hangman"**

$-.4\left(\frac{1}{2}x - 0.4\right) = 1.3 - 0.6(0.3 - 0.2x)$

$-.2x + .16 = 1.3 - .18 - .12x$

$-.2x + .16 = 1.12 - .12x$

$+.2x \quad +.2x$

$.16 = 1.12 + .08x$

$-1.12 \quad -1.12$

$-.96 = .08x$

$x = -12$

$\frac{1}{4}\left(5x + \frac{16}{3}\right) - \frac{2}{3}\left(\frac{3}{4}x + \frac{1}{2}\right) = -5$

$\frac{5}{4}x + \frac{4}{3} - \frac{1}{2}x - \frac{1}{3} = -5$

$\frac{3}{4}x + 1 = -5$

$-1 \quad -1$

$\frac{3}{4}x = -6$

$x = -8$

$(x+3)^2 = x(x+2) - 3$

$(x+3)(x+3) = x^2 + 2x - 3$

$x^2 + 6x + 9 = x^2 + 2x - 3$

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

$6x + 9 = 2x - 3$

$-9 \quad -9$

$6x = 2x - 12$

$-2x \quad -2x$

$\frac{4x}{4} = \frac{-12}{4}$ $\quad x = -3$

$\frac{x-4}{2} = \frac{x+2}{3}$

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

$2x + 4 = 3x - 12$

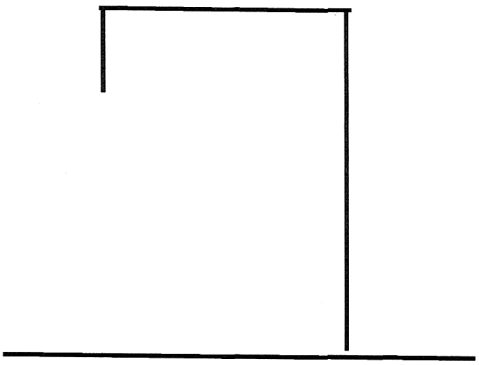
$-2x \quad -2x$

$4 = x - 12$

$+12 \quad +12$

$16 = x$

Solving Linear Equations
Hangman Activity



P	O	L	Y	N	O	M	I	A	L
4	8.25	−18.825	6	60	8.25	$-11\frac{1}{3}$	$-\frac{9}{7}$	8.3	−18.825

A	**I**	**O**
$4(x-7)=0.3(x+2)+2.11$	$3x-2(x+4)=8x+1$	$\frac{7}{3}\left(x+\frac{9}{28}\right)=20$
B	**J**	**P**
$-4(x-3)=5(2x-6)$	$\frac{x}{2.8}-4.9=-7.11$	$\frac{x-2}{3}+\frac{1}{6}=\frac{5}{6}$
C	**K**	**R**
$5(x+2)-1.5x=6$	$\frac{7}{4}(b-1)=\frac{7}{8}$	$-7x-4x=8-2x-8x$
D	**L**	**S**
$3(x-2)+5=2(5x-4)$	$\frac{5}{6}\left(\frac{3}{8}-x\right)=16$	$-8(1+4x)+7x=-25-8x$
E	**M**	**T**
$\frac{3}{4}x+2=\frac{5}{4}x-6$	$\frac{2}{3}\left(\frac{1}{4}x-2\right)=\frac{1}{5}(\frac{4}{3}x-1)$	$\frac{19}{4}-3.5x=-.25x+\frac{3}{2}$
H	**N**	**Y**
$\frac{9}{4}=-\frac{3}{2}x+\frac{19}{4}$	$\frac{3}{4}x+8=x-7$	$\frac{1}{7}+\frac{2x}{3}=\frac{15x-3}{21}$

Name Answers To Hangman
Math 8E

Date
Unit 2

Hangman Workspace

Goal - Solve the hidden message. Choose a letter and solve that equation in the space below. Check the solution to the following equation in your calculator. Add a body part to the board if your answer doesn't exist on one of those lines. Then, pick another letter and continue the steps.

A

$4(x-7) = .3(x+2) + 2.11$

$4x - 28 = .3x + .6 + 2.11$

$4x - 28 = .3x + 2.71$

$-.3x \quad -.3x$

$\frac{3.7x}{3.7} = \frac{30.71}{3.7}$

$x = 8.3$

N

$\frac{3}{4}x + 48 = x - 7$

$-48 \quad -8$

$\frac{3}{4}x = x - 15$

$-x \quad -x$

$-\frac{1}{4}x = -15$

$x = 60$

P

$\frac{x-2}{3} + \frac{1}{6} = \frac{5}{6}$

$-\frac{1}{6} \quad -\frac{1}{6}$

$\frac{x-2}{3} = \frac{4}{6}$

$6x - 12 = 12$

$+12 \quad +12$

$\frac{6x}{6} = \frac{24}{6}$

$x = 4$

M

$\frac{3}{5}\left(\frac{1}{4}x - 2\right) = \frac{1}{5}\left(\frac{4}{3}x - 1\right)$

$\frac{1}{5}x - \frac{4}{3} = \frac{4}{15}x - \frac{1}{5}$

$-\frac{1}{5}x \quad -\frac{1}{5}x$

$-\frac{4}{3} = \frac{1}{10}x - \frac{1}{5}$

$+\frac{1}{5} \quad +\frac{1}{5}$

$\frac{1}{10}x = \frac{-17}{15}$

$x = -11.33$

O

$\frac{7}{3}\left(x + \frac{9}{28}\right) = 20$

$\frac{7}{3}x + \frac{3}{4} = 20$

$-\frac{3}{4} \quad -\frac{3}{4}$

$\frac{7}{3}x = \frac{77}{4}$

$x = 8.25$ or $x = \frac{33}{4}$

L

$\frac{5}{6}\left(\frac{3}{8} - x\right) = 16$

$\frac{5}{16} - \frac{5}{6}x = 16$

$-\frac{5}{16} \quad -\frac{5}{16}$

$-\frac{5}{6}x = \frac{251}{16}$

$x = \frac{-753}{40}$

$x = -18.825$

I

$3x - 2(x+4) = 8x + 1$

$3x - 2x - 8 = 8x + 1$

$x - 8 = 8x + 1$

$-x \quad -x$

$-8 = 7x + 1$

$-1 \quad -1$

$-9 = 7x$

$x = \frac{-9}{7}$

Y

$21\left(\frac{3 \cdot 1}{7} + \frac{7 \cdot 2x}{3}\right) = \frac{15x - 3}{21} \cdot 21$

$3 + 14x = 15x - 3$

$-15x \quad -15x$

$\frac{-1x}{-1} = \frac{-3}{-1}$

$x = 3$

L

$\frac{5}{6}\left(\frac{3}{8} - x\right) = 16$

$\frac{5}{16} - \frac{5}{6}x = 16$

$-\frac{5}{16} \quad -\frac{5}{16}$

$-\frac{5}{6}x = \frac{251}{16}$

$x = \frac{-753}{40}$ -OR- $x = -18\frac{33}{40}$ OR $x = -18.825$

B| $x = 3$	C| $x = -\frac{8}{7}$
D| $x = 1$	E| $x = 16$
H| $x = \frac{5}{3}$	J| $x = -\frac{1547}{250}$, or $x = -6\frac{47}{250}$, or $x = -6.188$
K| $b = \frac{3}{2}$ or $b = 1.5$	R| $x = -8$
S| $x = 1$	I| $x = 1$