# 1.6 Solving Eqns W/Variables on Both Sides

## Solving Equations with Variables on Both Sides

(1) • Eliminate grouping symbols by using the distributive property or eliminate fractions by multiplying all terms by the LCD or a common multiple.

(3) • Move the variable to one side of the equation by adding or subtracting.

(4) • Move the constant to the other side of the equation by adding or subtracting.

(2) • Combine like terms if there is any on either side of equal sign

(5) • Isolate the variable by multiplying or dividing the variable's coefficient

• It does not MATTER which side the variable is on. Pick a side and keep it consistent.

* Variables on the LEFT SIDE, make life easier in Unit 2! *

**Example 1: Solve each equation. USE A SEPARATE SHEET TO DO EXAMPLES ON.**

a.) $5y + 2 = 2y - 4$ {-2}

b.) $2n - 5 = 8n + 1$ {-1}

c.) $4x + 6 - 11 = x - 8x - 5$ {0}

d.) $2(x + 1) - 5 = 3 - (6x + 2)$ {1/2}

e.) $\frac{5}{6}x - \frac{1}{3} = \frac{3}{4}x + 2$ {28}

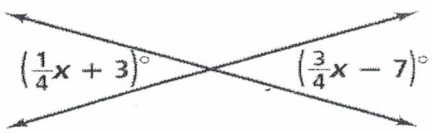
f.) $0.08x - 3 = 0.4x + 1$ {-12.5}

g.) $\frac{x}{5} = \frac{6}{4}$ {7.5}

h.) $\frac{b+2}{14} = \frac{b}{10}$ {5}

i.) $\frac{w+3}{4} = \frac{w-4}{6}$ {-17}

_____ (aka opposite angles) are _____ of each other when two lines _____. These angles are _____ (or equal) to each other.



FdM1 1.6 Notes

## Example 1:

move variables!

a) $5y+2=2y-4$

$-2y \quad -2y$

move the constant!

$3y+2=-4$

$-2 \quad -2$

$\frac{3y}{3}=\frac{-6}{3}$

$y=-2$

$\{-2\}$

b) $2n-5=8n+1$

$-8n \quad -8n$

$-6n-5=1$

$+5 \quad +5$

$\frac{-6n}{-6}=\frac{6}{-6}$

$n=-1$

$\{-1\}$

c) $4x+6-11=x-8x-5$ combine like terms!

$4x-5=-7x-5$

$+7x \quad +7x$

$11x-5=-5$

$+5 \quad +5$

$\frac{11x}{11}=\frac{0}{11}$

$x=0$

$\{0\}$

d) $2(x+1)-5=3-1(6x+2)$

distribute first!

$2x+2-5=3-6x-2$

$2x-3=1-6x$ combine like terms!

$+6x \quad +6x$

$8x-3=1$

$+3 \quad +3$

$\frac{8x}{8}=\frac{4}{8}$

$x=\frac{4}{8}$ Reduce

$x=.5$ or $1/2$

$\{1/2\}$

Denominators: 6, 3, 4, 1

e) $\frac{5}{6}x - \frac{1}{3} = \frac{3}{4}x + 2$ LCD 12 or common multiple 72 (6·3·4·1)

$12\left(\frac{5}{6}x - \frac{1}{3}\right) = 12\left(\frac{3}{4}x + 2\right)$

12(5/6)

$10x - 4 = 9x + 24$ NO MORE FRACTIONS! YEA!! ☺

$-9x \quad -9x$

$x - 4 = 24$

$+4 \quad +4$

$x = 28$

$\{28\}$

f) $0.08x - 3 = 0.4x + 1$

$-0.4x \quad -0.4x$

$-0.32x - 3 = 1$

$+3 \quad +3$

$\frac{-0.32x}{-0.32} = \frac{4}{-0.32}$

$x = -12.5$

$\{-12.5\}$

g) $\frac{x}{5} = \frac{6}{4}$ cross multiply

$4x = 30$

$\frac{4x}{4} = \frac{30}{4}$

$x = \frac{30}{4}$ REDUCE

$x = \frac{15}{2}$ or 7.5

$\{7.5\}$

h) $\frac{b+2}{14} = \frac{b}{10}$

$14b = 10(b+2)$

$14b = 10b + 20$

$-10b \quad -10b$

$4b = 20$

$\frac{4b}{4} = \frac{20}{4}$

$b = 5$

$\{5\}$

i) $\frac{w+3}{4} = \frac{w-4}{6}$

$6(w+3) = 4(w-4)$

$6w + 18 = 4w - 16$

$-4w \quad -4w$

$2w + 18 = -16$

$-18 \quad -18$

$2w = -34$

$\frac{2w}{2} = \frac{-34}{2}$

$w = -17$

$\{-17\}$