Solve Equations with Variables on Both Sides

Main Idea:

1. Simplify each side of the equation first.
2. Get the variable on only one side of the equation.

Ex 1: $9x-8=4x+12$

$9x+(-8)=4x+12$

$+(-4x)$ $+(-4x)$

$5x+(-8)=12$

$+8$ $+8$

$\frac{5x}{5}=\frac{20}{5}$

$x=4$

Chk

$36-8=16+12$

$28=28$ ✓

Ex 2: $13+3x=-6x+4$

$+6x$ $+6x$

$13+9x=4$

$+(-13)$ $+(-13)$

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

$x=-1$

Chk

$13+(-3)=6+4$

$10=10$ ✓

Ex 3: $\frac{1}{3}(15x-24)=8+4(x-3)$

$\frac{1}{3}(15x+(-24))=8+4(x+(-3))$

$5x+(-8)=8+4x+(-12)$

$5x+(-8)=4x+(-4)$

$+(-4x)$ $+(-4x)$

$x+(-8)=-4$

$+8$ $+8$

$x=4$

Chk

$\frac{1}{3}(60-24)=8+4(1)$

$\frac{1}{3}(36)=8+4$

$12=12$ ✓

Ex 4: $7x-2(4-3x)=2(x-10)+5x$

$7x+(-2)(4+(-3x))=2(x+(-10))+5x$

$7x+(-8)+6x=2x+(-20)+5x$

$13x+(-8)=7x+(-20)$

$+(-7x)$ $+(-7x)$

$6x+(-8)=-20$

$+8$ $+8$

$\frac{6x}{6}=\frac{-12}{6}$

$x=-2$

Ex 5: $3(x-4)=\frac{1}{3}(6+9x)$

$3(x+(-4))=\frac{1}{3}(6+9x)$

$3x+(-12)=2+3x$

$+(-3x)$ $+(-3x)$

$-12=2$ Always False

No Real Solution

Ex 6: $9x-3(x+1)=2(x-5)+4x+7$

$9x+(-3)(x+1)=2(x+(-5))+4x+7$

$9x+(-3x)+(-3)=2x+(-10)+4x+7$

$6x+(-3)=6x+(-3)$

$+(-6x)$ $+(-6x)$

$-3=-3$ Always True

$x=\{\text{All Real \#s}\}$

Assignment #10

Part I: p. 157 #3-13 odd, 22-28

Part II: p. 158 #32-43