

2.1 Solving Equations That Have Variables On Both Sides

- An equation is like a balanced scale.
- Use opposite operations to undo what was "done" to the variable.
- Undo the operations in reverse order
+ and - first; then $\times$ and $\div$
- Combine like terms

ONLY IF
they are on the same side of the equation.

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Examples

1. $9y - 7 = 5y - 5$

$$9y - 5y - 7 = -5$$

$$4y - 7 = -5$$

$$4y = -5 + 7$$

$$4y = 2$$

$$y = \frac{2}{4}$$

$$\boxed{y = \frac{1}{2}}$$

2. $x - 7 = 13 - 4x$

$$x - 7 + 4x = 13$$

$$x + 4x - 7 = 13$$

$$5x - 7 = 13$$

$$5x = 13 + 7$$

$$5x = 20$$

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

$$\boxed{x = 4}$$

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3. $7 - a = 6 + 5a$

$$7 - a - 5a = 6$$

$$-6a + 7 = 6$$

$$-6a = 6 - 7$$

$$-6a = -1$$

$$a = \frac{-1}{-6}$$

$$\boxed{a = \frac{1}{6}}$$

OR

$$7 = 6 + 5a + a$$

$$7 = 6 + 6a$$

$$7 - 6 = 6a$$

$$1 = 6a$$

$$\boxed{\frac{1}{6} = a}$$

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4. $8k - 36 = -4k$

$$8k - 36 + 4k = 0$$

$$8k + 4k - 36 = 0$$

$$12k - 36 = 0$$

$$12k = 0 + 36$$

$$12k = 36$$

$$k = \frac{36}{12}$$

$$\boxed{k = 3}$$

OR

$$-36 = -4k - 8k$$

$$-36 = -12k$$

$$\frac{-36}{-12} = k$$

$$\boxed{3 = k}$$

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5. $8m - 3 = 5m - m$

$$8m - 3 = 4m$$

$$8m - 4m - 3 = 0$$

$$4m - 3 = 0$$

$$4m = 0 + 3$$

$$4m = 3$$

$$\boxed{m = \frac{3}{4}}$$

6. $9 + 2(5v + 3) = 13v$

$$9 + 2(5v) + 2(3) = 13v$$

$$9 + 10v + 6 = 13v$$

$$9 + 6 + 10v = 13v$$

$$15 + 10v = 13v$$

$$15 = 13v - 10v$$

$$15 = 3v$$

$$\frac{15}{3} = v$$

$$\boxed{5 = v}$$

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HOMEWORK

Worksheet - HW 2.1 - Day 7

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