

Name: \_\_\_\_\_

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## Combining Like Linear Terms Algebra 1

In our manipulation of linear equations, we will often need to combine like linear terms. We will begin by reviewing the real number properties that you will use in this process.

**Exercise #1:** Fill in the blanks of each of the following lines with the real number property that justifies the particular step.

$$(1) \quad 5x + 7y + 4x + 5y = 5x + 4x + 7y + 5y \quad (1) \quad \underline{\hspace{4cm}}$$

$$(2) \quad \quad \quad = (5+4)x + (7+5)y \quad (2) \quad \underline{\hspace{4cm}}$$

$$= 9x + 12y \quad (3) \quad \underline{\hspace{4cm}}$$

Of course, we would like to be able to combine like terms without this multi-step process. Clearly, terms will only be “like” if they contain the same linear variable.

**Exercise #2:** Simplify each expression by combining like terms.

(a)  $5x + 8y + 6x + 9y$

(b)  $3x + 7 + x - 5$

(c)  $1.4x + 2.9y + 3.2x - 1.5y$

(d)  $6x - 5y - 10x + 8y$

(e)  $-5x + 8 + 12x - 3$

(f)  $8x - 3 - 12x + 8$

(g)  $-4a + 3b + 9a - 10b$

(h)  $-7x + 4 + 3x - 10$

(i)  $12a + 2b - 6a - 8b$

The skill of combining like terms will arise frequently when solving linear equations.

**Exercise #3:** Solve the following equation by first combining like terms. **Make sure to list the properties that you used to solve these equations.**

$$2x + 3 + 3x + 4 = 17$$

**Exercise #4:** Solve each of the following linear equations. Make sure to list the properties that you used to solve these equations.

(a)  $5x + 4 + 4x = -104$

(b)  $3 + 7x - 2x + 4 = 22$

(c)  $-26 = 2 + 3x + 4 + x$

(d)  $-1 + 2.7x + 4 + 0.3x = 21$

(e)  $\frac{6}{11}x + 3 + \frac{3}{11}x + 5 = 26$

(f)  $13 = -6x - 5 + 2x + 6$

**Exercise #5:** Translate each of the following verbal phrases into equations and then solve for the number described.

(a) The sum of four times a number and six times a number increased by eleven is 51.

(b) Four less than three times a number increased by six times the same number is 32.

(c) Three times a number subtracted from 4 less than seven times a number is 28.