

Pre-Algebra
Skill Builder #LE - 5
Solving Linear Equations Involving Like Terms

Remember our method for solving $ax+b=cx+d$:

- 1) Put the terms involving the variables on one side.
- 2) Put the terms involving the constants on the other side.
- 3) Use the Multiplication/Division Property to solve the equation.

In this skill builder we must first combine like terms before we do the above steps.

Here is a walk-through of some examples of solving linear equations involving like terms. Study the steps very carefully so that when you are doing the problems on the next page you will be prepared.

- 1) $14 - 5t - 5t - 8 = 2t - 6t + 6$ We wish to solve this equation.
 $6 - 10t = -4t + 6$ We have combined like terms.
 $6 - 10t + 4t = -4t + 4t + 6$ I have decided to put the variables on the LHS.
 $6 - 6t = 6$ Now we have simplified.
 $6 - 6t - 6 = 6 - 6$ I have decided to put the constants on the RHS.
 $-6t = 0$ Now we have simplified.
 $-\frac{1}{6}(-6t) = -\frac{1}{6}(0)$ We multiply by the reciprocal of -6.
 $t = 0$ Now we have our answer.
- 2) $21 - t + 4t - 6 = 3t + t - 2t + 5$ We wish to solve this equation.
 $15 + 3t = 2t + 5$ We have combined like terms.
 $15 + 3t - 2t = 2t + 5 - 2t$ I have decided to put variables on the LHS.
 $15 + t = 5$ Now we simplified.
 $15 + t - 15 = 5 - 15$ I subtract 15 from both sides.
 $t = -10$ Now we simplified.
 $t = -10$ Because the reciprocal of one is itself we are done.
- 3) $6x + x - 8x - 4 = 3x - x - x - 2$ We will solve this equation.
 $-x - 4 = x - 2$ We have combined like terms.
 $-x - 4 - x = x - 2 - x$ I have decided to put variables on the LHS.
 $-2x - 4 = -2$ Now we have simplified.
 $-2x - 4 + 4 = -2 + 4$ I have decided to put constants on the RHS.
 $-2x = 2$ Now we have simplified.
 $x = \frac{2}{-2}$ We have multiplied both sides by the recip. of -2.
 $x = -1$ Now we have our answer.

Pre-Algebra
Skill Builder #LE - 5
Solving Linear Equations Involving Like Terms

Solve the following equations.

1) $x + 2x + 3x + 5 = 17$

2) $4y - y + 1 = 3y + 2y - 1$

3) $-p - (-2p) + 7 - (-11) = 5p - p + 8$

4) $-3p - (-p) - (-3) - 5 = -(-2p) - 4p + 6$

5) $2 - (-8) - 3z - 2z = 10 - z - 4z$

6) $-8 - (-4z) - 9 - z = 3 + z - (-3z)$

7) $3.6t + 1.3 - 4t = 2 - 0.1t - t$

8) $4 - \frac{3a}{4} + \frac{a}{6} = a - \frac{a}{8} + \frac{5a}{12} + 2$

(a little more difficult)

Pre-Algebra
Skill Builder #LE - 5
Solving Linear Equations Involving Like Terms

Answer Key:

1) $x = 2$

2) $y = 1$

3) $p = \frac{10}{3}$

4) No solution.

5) All real numbers.

6) $z = -20$

7) $t = 1$

8) $a = \frac{16}{15}$