NAME _____   DATE _____

Module 3   Solving Linear Equations
              of One Variable
Lesson 5   Solving Multi-Step Linear Equations

Lesson Objectives

• Solve equations involving more than one step.
• Solve multi-step equations involving fractions.
• Solve multi-step equations using the Distributive Property.
• Solve equations that are identities.
• Solve equations that have no solution.

A multi-step equation is an equation requiring more than one

_____ to solve it.

Terms with variables are like terms if they have the same

_____ to the same _____.
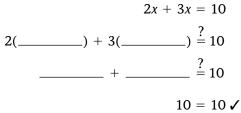
Solve: $2x + 3x = 10$

           _____ = _____

           $\dfrac{5x}{5} = \dfrac{10}{5}$

           $x =$ _____

To check this solution, replace each x with _____ and see if the resulting

statement is true.

Check: $2x + 3x = 10$

        $2(\underline{\hspace{1cm}}) + 3(\underline{\hspace{1cm}}) \overset{?}{=} 10$

        _____ + _____ $\overset{?}{=} 10$

                    $10 = 10$ ✓
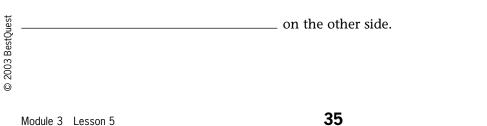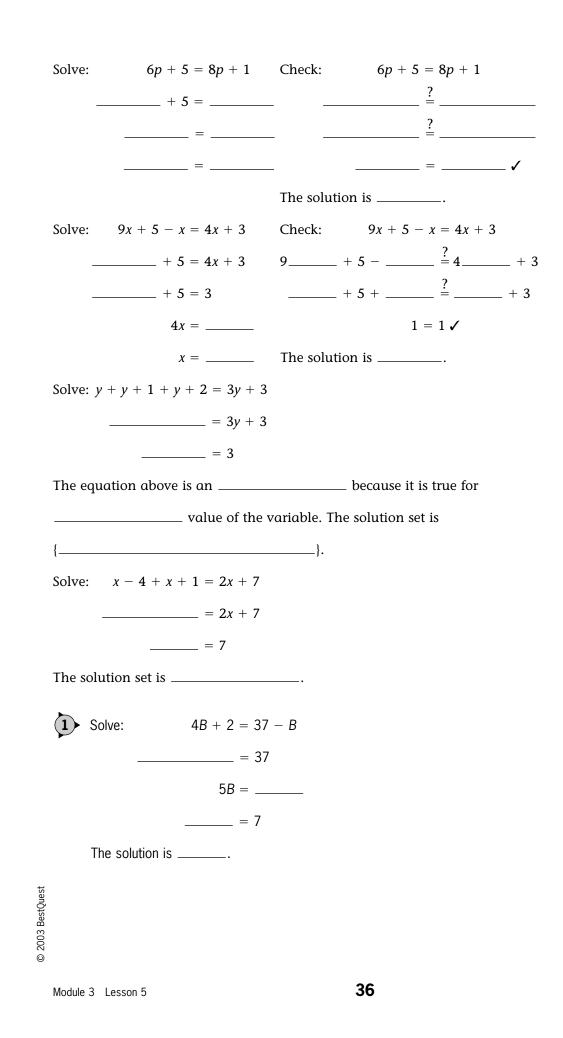
To solve an equation with variables on both sides you get all the terms

involving _____ on one side of the equation and all the

_____ on the other side.
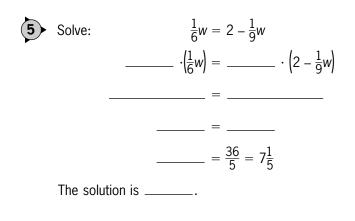
Solve: $6p + 5 = 8p + 1$ Check: $6p + 5 = 8p + 1$

_____ $+ 5 =$ _____   _____ $\overset{?}{=}$ _____

_____ $=$ _____   _____ $\overset{?}{=}$ _____

_____ $=$ _____   _____ $=$ _____ ✓

The solution is _____.

Solve: $9x + 5 - x = 4x + 3$ Check: $9x + 5 - x = 4x + 3$

_____ $+ 5 = 4x + 3$ 9_____ $+ 5 -$ _____ $\overset{?}{=} 4$_____ $+ 3$

_____ $+ 5 = 3$ _____ $+ 5 +$ _____ $\overset{?}{=}$ _____ $+ 3$

$4x =$ _____ $1 = 1$ ✓

$x =$ _____   The solution is _____.

Solve: $y + y + 1 + y + 2 = 3y + 3$

_____ $= 3y + 3$

_____ $= 3$

The equation above is an _____ because it is true for

_____ value of the variable. The solution set is

{_____}.

Solve: $x - 4 + x + 1 = 2x + 7$

_____ $= 2x + 7$

_____ $= 7$

The solution set is _____.

1 Solve: $4B + 2 = 37 - B$

_____ $= 37$

$5B =$ _____

_____ $= 7$

The solution is _____.

2▶ Solve: $z + 7 + 3z = 2z + 5 + 2z + 2$

$$\text{_____} = 4z + 7$$

$$7 = \text{_____}$$

This equation is an _____ .

The solution set is {_____}.

Example: $4(3m - 2) + 1 = 17$

$$\text{_____} + 1 = 17$$

$$12m - \text{_____} = 17$$

$$12m = \text{_____}$$

$$\text{_____} = \text{_____}$$

The solution is _____ .

Example: $\frac{1}{2}j - 6 = -20 - \frac{2}{3}j$

$$\text{_____} \cdot \left(\frac{1}{2}j - 6\right) = \text{_____} \cdot \left(-20 - \frac{2}{3}j\right)$$

$$\text{_____} = -120 - 4j$$

$$\text{_____} - 36 = -120$$

$$7j = \text{_____}$$

$$j = \text{_____}$$

The solution is _____ .

To eliminate fractions in an equation, multiply both sides by the

_____ .

3▶ Solve: $13z = 3(16 - z)$

$$\text{_____} = \text{_____}$$

$$\text{_____} = \text{_____}$$

$$\text{_____} = \text{_____}$$

The solution is _____ .

4▶ Solve: $4(t + 3) = 2(2t + 1)$

$$\text{_____} = \text{_____}$$

$$\text{_____} = \text{_____}$$

The equation has _____ solution.

The solution set is _____ .

5 ▶ Solve: $\frac{1}{6}w = 2 - \frac{1}{9}w$

$$\underline{\hspace{2cm}} \cdot \left(\frac{1}{6}w\right) = \underline{\hspace{1.5cm}} \cdot \left(2 - \frac{1}{9}w\right)$$

$$\underline{\hspace{3cm}} = \underline{\hspace{3cm}}$$

$$\underline{\hspace{1.5cm}} = \underline{\hspace{1.5cm}}$$

$$\underline{\hspace{2cm}} = \frac{36}{5} = 7\frac{1}{5}$$

The solution is $\underline{\hspace{1.5cm}}$.

When solving a multi-step equation:

• Eliminate parentheses by using the $\underline{\hspace{5cm}}$.

• Simplify each side of the equation as needed, by

$\underline{\hspace{12cm}}$.

• Get all the $\underline{\hspace{3cm}}$ terms on one side of the equation and all

the $\underline{\hspace{3cm}}$ terms on the other side.

• Simplify each side of the equation as needed, by

$\underline{\hspace{12cm}}$.

• Divide both sides by the variable's coefficient.

An equation is a mathematical statement that has the same value on either

side of the $\underline{\hspace{5cm}}$. Every step in solving an

equation will have an $\underline{\hspace{5cm}}$ in it.

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