Algebra I
Notes Section 2.5
Solve Equations with Variables on Both Sides

Big Ideas
1. How to solve equations with variables on both sides.
2. How to collect the variable terms on one side and the constant terms on the other side.
3. How to simplify expressions on each side of the equation by using the distributive property to remove grouping symbols and then combining like terms.
4. How to identify that some equations, called identities, are true for all values of the variable. Other equations have no solutions.

EXAMPLE 1 Solve.

a) $7 - 8x = 4x - 17$ b) $2m - 6 + 4m = 12$ c) $9 - 3k = 17 - 2k$

EXAMPLE 2 Solve.

a) $5z - 2 = 2(3z - 4)$ b) $3 - 4a = 5(a-3)$

c) $9x - 5 = 1/4 (16x + 60)$ d) $8y - 6 = 2/3 (6y + 15)$

EXAMPLE 3   A car dealership sold **78** new cars and **67** used cars this year. The number of new cars sold by the dealership has been increasing by **6** cars each year. The number of used cars sold by the dealership has been decreasing by **4** cars each year. **If these trends continue, in how many years will the number of new cars sold be twice the number of used cars sold?**

New Cars Sold   +   Increase in   = 2   Used Cars Sold   +   Decrease in
this year   New Cars   this year   Used Cars

EXAMPLE 4   Solve the equation, if possible.

a) $3x = 3(x + 4)$ b) $2x + 10 = 2(x + 5)$ c) $7w + 1 = 8w + 1$