## Review Problem - Solve

1) $\frac{2}{5}(10x + 15) = 18 - 4(x - 3)$

$\frac{2}{5} \cdot \frac{10x}{1} + \frac{3}{5} \cdot \frac{15}{1} = 18 + -4x + 12$

$4x + 6 = 30 + -4x$

$+4x \qquad +4x$

$8x + 6 = 30$

$-6 \quad -6$

$8x = 24$

$x = 3$

# Solving Real-Life Problems using Equations with a Variable on Each Side

Steps:

1) Read through the problem and sketch a plan.
2) Define the variable; let n = _____
3) Write an equation with a variable on each side.
4) Solve the equation. The solution is called a breakeven point.
5) Explain your solution with a statement.

Breakeven Point - the number or value where both options or plans are equal. An analysis of values above or below the breakeven point can determine which option is better.

Example One: A gym offers two packages for yearly memberships. The first plan costs $50 to be a member, then each visit to the gym is $5. The second plan costs $200 for a membership fee plus $2 for each visit. Write and solve an equation to find the number of visits to the gym where both plans are equal. Explain your solution.

Define the variable v = number of visits

Plan 1 = Plan 2

$50 + 5v = 200 + 2v$

$-2v \quad -2v$

$50 + 3v = 200$

$-50 \quad -50$

$3v = 150$

$v = 50$

At 50 visits, both gym memberships have the same cost.

Example Two: A gamers club charges a $30 membership fee plus $10 per game rented. Another club charges $15 per game rented, but has no membership fee. Write and solve an equation to find the number of games rented where both plans are equal. Explain your solution.

Define the variable g = number of games rented

$$30 + 10g = 15g$$
$$-10g \quad -10g$$
$$30 = 5g$$
$$6 = g$$

At 6 games rented, both gamers clubs have the same cost.

Example Three: Taylor and Maddie went shopping. Taylor buys a hoodie for $25, a pair of jeans for $18, and three shirts. Maddie buys a purse for $30 and five shirts. All of the shirts cost the same amount, and both spend the same amount of money. Write and solve an equation to find the cost of one shirt.

Define the variable c = cost of one shirt

$$25 + 18 + 3c = 30 + 5c$$

$$43 + 3c = 30 + 5c$$

$$-3c \qquad -3c$$

$$43 = 30 + 2c$$

$$-30 \quad -30$$

$$13 = 2c$$

$$\$6.50 = c$$

Each shirt has a cost of $6.50.