Math Review For Economics–Algebra **Name:**

Simplifying Expressions

When simplifying, pay careful attention to any distribution through parentheses of a number or a negative sign.

Example 1. Rewrite the formula $T = 5(x + .05(x + 30)) - (.12x + 40)$ by using distribution.

There are nested parentheses in the first part of the formula. We will start with the innermost one.

$T =$	$5(x + .05x + 1.5) - (.12x + 40)$	Distribute the .05
$=$	$5(1.05x + 1.5) - (.12x + 40)$	Add like terms in the first parentheses.
$=$	$5(1.05x + 1.5) - .12x - 40$	Distribute the -1
$=$	$5.25x + 7.5 - .12x - 40$	Distribute the 5
$T =$	$5.13x - 38.5$	Finally, combine like terms.

Practice problems.

1. Evaluate $-(3 - 5) - [2 - (3^2 - 13)]$

2. Subtract $(-4y^2 - 3y + 8) - (2y^2 - 6y - 2)$

3. Find $-9m(2m^2 + 3m - 1)$

4. Simplify $3(y - 5) - (2y - 7) + (8y + 1)$

5. Simplify $8R + (T - 3S) - (1 + S - R)$

Equations and Functions

The following problems ask you to use a given equation that relates the variables to answer a question. Sometimes, evaluating the equation is all that is needed. Sometimes, you'll have to understand the real-life situation to fully respond.

1. Evaluate if $p = -2$, $q = 4$ and $r = -5$
   $\dfrac{q + r}{q + p}$

2. Lenders are required to state the annual percentage rate (APR) for every loan, using the formula $APR = 12r$, where r is the monthly interest rate. Find the monthly interest rate when $APR = 19.5$.

3. The following equation shows g is a function of t:

$$g = 7 - 3t$$

Find g when $t = 0$, 1 and 2. If we also know that $t = 2s + 13$, derive an equation for g as a function of s.

4. According the the data from the Department of Commerce, movie-theater box-office receipts (in millions of dollars) can be approximated by $y = 494.65x + 2971.03$, where $x = 0$ corresponds to the year 1995.

   (a) In this equation, what does 494.65 mean?

   (b) Assuming this equation remains valid, in what year will box office receipts reach 8,000,000,000?