

## Section 3.5 Composite Functions

### Review of Evaluating Functions for Given Inputs

See section 3.1.

### Review of Simplifying Rational Expressions

A rational number is the quotient of two integers. A **rational expression** is the quotient of two polynomial expressions. A simplified rational expression has the form  $\frac{P}{Q}$  where  $P$  and  $Q$  are polynomials such that  $P \neq 0$  and the degree of  $Q$  is greater than or equal to 1.

### Objective 4: Forming and Evaluating Composite Functions

**Definition:** Given functions  $f$  and  $g$ , the **composite function**,  $f \circ g$  (also called the **composition of  $f$  and  $g$** ) is defined by  $(f \circ g)(x) = f(g(x))$  provided  $g(x)$  is in the domain of  $f$ .



The composition of  $f$  and  $g$  does not equal the product of  $f$  and  $g$ :  $(f \circ g)(x) \neq fg(x)$ .

Also, the composition of  $f$  and  $g$  does not necessarily equal the composition of  $g$  and  $f$  though this equality does exist for certain pairs of functions.