

Operations on Functions

MAT 1375 Spring 2012

1. If f and g are functions then their **sum** is the function $f + g$ defined by

$$(f + g)(x) = f(x) + g(x).$$

2. If f and g are functions then their **difference** is the function $f - g$ defined by

$$(f - g)(x) = f(x) - g(x).$$

3. If f and g are functions then their **product** is the function fg defined by

$$(fg)(x) = f(x)g(x).$$

4. If f and g are functions then their **quotient** is the function f/g defined by

$$\left(\frac{f}{g}\right)(x) = \frac{f(x)}{g(x)}.$$

5. The domain of the sum, difference and product functions is the set of all real numbers that are in **both** the domain of f and g .

6. The domain of the quotient function is the set of all real numbers that are in **both** the domain of f and g such that $g(x) \neq 0$.

7. Let f and g be functions. The **composite function** of f and g is defined as follows. For input x , the output is $g(f(x))$. This composite function is denoted $g \circ f$

8. The rule of the composite function is

$$(g \circ f)(x) = g(f(x)).$$

9. The domain of the composite function $g \circ f$ is the set of all real numbers x such that x is in the domain of f and $f(x)$ is in the domain of g .