7.7 Operation on Functions

1. Find the sum, difference, product, and quotient of a function,
2. Find the composition of a function.

You can perform operations on functions much like you do on Rational Expressions.

Add/Subtract: must combine like terms…

Let f(x) and g(x) be any two functions. You can add, subtract, multiply or divide functions according to the following rules:

Operation	Definition	Ex.if f(x) = x+2 and g(x) = 3x
SUM	$(f+g)(x) = f(x) + g(x)$	$(x+2) + 3x =$
DIFF.	$(f-g)(x) = f(x) - g(x)$	$(x+2) - 3x =$
PROD.	$(f \cdot g)(x) = f(x) \cdot g(x)$	$(x+2) \cdot (3x) =$
QUOT.	$(f/g)(x) = f(x)/ g(x), g(x) \neq 0$	$\frac{x+2}{3x}$

Add & Subtract

Given $f(x) = x^2 – 3x + 1$ and $g(x) = 4x + 5$

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

b) $(f – g)(x) =$

Multiply and Divide

$f(x) = x^2 + 5x - 1$ and $g(x) = 3x - 2$

a) $(f \cdot g)(x) =$

b) $(f/g)(x) =$

Composition of Functions

In a composition, a function is performed and then a second function is performed using the result of the first operation.

Composition is denoted with the open multiplication symbol as follows:

$(f \circ g)(x) = f[g(x)]$ plug (g) equation into (f) equation for x

$f \circ g \neq g \circ f$, so the order in which you perform the composition is important.

If $f(x) = x + 3$ and $g(x) = x^2 + x + 1$, find the following compostions:

a) f [g(x)] =

b) g [f(x)] =

c) f [g(2)] =

Compositions of Relations

If f(x) = {(7,8), (5,3), (9,8), (11,4)} and g(x) = {(5,7), (3,5), (7,9), (9,11)}, find f ∘ g and g ∘ f.

f ∘ g

f[g(5)] =

f[g(3)] =

f[g(7)] =

f[g(9)] =

g ∘ f

g[(7)] =

g[(5)] =

g[(9)] =

g[(11)] =

Homework

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