

2.7 The Algebra of Functions

Name _____

We will cover 5 ways of combining functions. Consider the functions $f(x) = x^2 + 2$ and $g(x) = x^3 - 2x$ as examples.

Operation	Definition	Example
<i>Addition</i>	$(f + g)(x) = f(x) + g(x)$	$(f + g)(x) = (x^2 + 2) + (x^3 - 2x)$
<i>Subtraction</i>	$(f - g)(x) = f(x) - g(x)$	$(f - g)(x) = (x^2 + 2) - (x^3 - 2x)$
<i>Multiplication</i>	$(fg)(x) = f(x)g(x)$	$(fg)(x) = (x^2 + 2)(x^3 - 2x)$
<i>Division</i>	$\left(\frac{f}{g}\right)(x) = \frac{f(x)}{g(x)}$	$\left(\frac{f}{g}\right)(x) = \frac{x^2+2}{x^3-2x}$
<i>Composition</i>	$(f \circ g)(x) = f(g(x))$	$(f \circ g)(x) = (x^3 - 2x)^2 + 2$

1. Given the function $g(t) = \frac{1}{t} + \frac{t}{2}$ and $h(t) = -2t^3$, calculate

$$(g + h)(t) =$$

$$(g - h)(1) =$$

$$(gh)(x) =$$

$$\left(\frac{g}{h}\right)(t) =$$

$$\left(\frac{h}{g}\right)(-2) =$$

$$(g \circ h)(t) =$$

$$(h \circ g)(1) =$$