

Warm-Up:

$$f(x) = 4x - 3 \quad g(x) = 10x + 7$$

Find:

1) $f(x) + g(x)$

2) $f(x) - g(x)$

3) $f(x) \cdot g(x)$

Section 7-1: Operations on Functions

Any operation may be done on any function according to the following rules:

Operation	Written	Simplified
Add	$(f + g)(x)$	$f(x) + g(x)$
Subtract	$(f - g)(x)$	$f(x) - g(x)$
Multiply	$(f \cdot g)(x)$	$f(x) \cdot g(x)$
Divide	$(f \div g)(x)$	$f(x) \div g(x)$ <u>Note:</u> $g(x) \neq 0$.

Examples:

Given $f(x) = 3x^2 + 7x$ and $g(x) = 2x^2 - x - 1$, find each function.

1) $(f + g)(x)$

2) $(f - g)(x)$

Examples:

Given $f(x) = 3x^2 - 2x + 1$ and $g(x) = x - 4$, find each function.

3) $(f \cdot g)(x)$

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

Operation
Composition
of Functions

Written
 $(f \circ g)(x)$

Simplified
 $f[g(x)]$

The domain of g goes to the range of g . The range of g is the same as the domain of f . The domain of f goes to the range of f .

Examples:

5) If $f(x) = \{(2, 6), (9, 4), (7, 7), (0, -1)\}$ and $g(x) = \{(7, 0), (-1, 7), (4, 9), (8, 2)\}$, find $f \circ g$ and $g \circ f$.

Examples:

6) If $f(x) = 3x^2 - x + 4$ and $g(x) = 2x - 1$, find $f \circ g$ and $g \circ f$.

Examples:

6) If $f(x) = 3x^2 - x + 4$ and $g(x) = 2x - 1$, find $[f \circ g](-2)$ and $[g \circ f](x)$.

Examples:

7) Tracey Long has \$100 deducted from every paycheck for retirement. She can have this deduction taken before state taxes are applied, which reduces her taxable income. Her state income tax rate is 4%. If Tracey earns \$1500 every pay period, find the difference in her net income if she has the retirement deduction taken before or after taxes.

Homework: pg. 388-390 #14-20 even, 21, 22-44 even, 56

Section 7-1 Vocab