

PC 1-8 Compositions of Functions

Students will perform operations on functions

Given the following functions, fill in the table and simplify. $f(x) = x + 2$ $g(x) = x^2 - 4$

$f(x) + g(x)$	$(f + g)(0)$	$f + g$
$f(-1) - g(5)$	$(f - g)(2)$	$f - g$
$f(x)g(x)$	$(fg)(2)$	$(f * g)(1)$
$\frac{f(x)}{g(x)}$	$\frac{f}{g}(3)$	$f/g(2)$
$f(g(x))$	$(f \circ g)(1)$	$(g \circ f)(1)$
$g(f(3))$	$g(2) * f(3)$	$g(g(4))$

Let $h(x) = 5x + 3$

Let $m(x) = \sqrt{x + 1}$

a) Find $(h + m)(x)$

b) Find $(h \circ m)(x)$

x	-4	-1	3	5	10
$f(x)$	-2	7	5	10	-1
$g(x)$	3	5	-2	1	4
$h(x)$	5	6	-1	-4	-2

Use the table to evaluate the following:

1) $f(3)$	2) $(f + h)(10)$	3) $(fg)(3)$	4) $\left(\frac{h}{f}\right)(-4)$
5) $(g \circ f)(5)$	6) $(f \circ h)(10)$	7) $(h \circ h)(-1)$	8) $g(h(f(3)))$
9) $f(-1) + 5$	10) $-g(-4) - 7$	11) $f^{-1}(5)$	12) $h^{-1}(-4)$
13) $f(f^{-1}(10))$	14) $h^{-1}(h(3))$	15) $f^{-1}(10)$	16) $h^{-1}(-1)$

Find each of the following for the functions: $f(x) = \frac{2}{3x+1}$ $g(x) = 3x^2 + 1$ $h(x) = 2x - 5$

1) $f(g(2))$	2) $(h \circ f)(1)$
3) $(h + g)(1)$	4) $g(g(0))$
5) $(f - g)(0)$	6) $(g \cdot g)(x)$
7) $(g \circ h)(x)$	8) $(h \circ h)(x)$

-----ANSWERS-----

- 1)** 1/20 **2)** -4 **3)** 1 **4)** 4 **5)** 1 **6)** $9x^4 + 6x^2 + 1$ **7)** $12x^2 - 60x + 76$ **8)** $4x - 15$
9) 113.1 cm^3 **10)** 6 cm **11)** 904.8 cm^3 **12)** $32/3 \pi r^3$