

Algebra 3 Assignment # 1

Composition of Functions

(1) Find each of the following numbers, given the functions below.

$$f(x) = \sqrt{2x - 1} \quad ; \quad g(x) = 2x^2 - x - 2 \quad ; \quad h(x) = x^2 + 1$$

(a) $f(h(2))$

(b) $g(h(1))$

(c) $g(f(25))$

(d) $h(f(g(3)))$

(2) Find $f(g(x))$ and $g(f(x))$ for each of the following please.

(a) $f(x) = 3x^2 + 2x - 1$
 $g(x) = 4x - 5$

(b) $f(x) = \frac{2x + 5}{4x - 3}$
 $g(x) = \frac{x + 2}{3x - 1}$

(3) Find $g(x)$ if $f(x) = \frac{3x - 1}{2x + 5}$, and $f(g(x)) = \frac{x + 9}{12x - 11}$.

(4) Find $f(f(x))$ if $f(x) = \frac{2x + 3}{3x - 2}$

(5) Find all values of x such that $f(g(x)) = g(f(x))$ if $f(x) = 2x^2 - 3x + 2$, and $g(x) = 3x - 2$.

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Answers

(1) (a) 3

(b) 4

(c) 89

(d) 26

(2) (a) $f(g(x)) = 48x^2 - 112x + 64$

(b) $f(g(x)) = \frac{17x - 1}{-5x + 11}$

$g(f(x)) = 12x^2 + 8x - 9$

$g(f(x)) = \frac{10x - 1}{2x + 18}$

(3) $g(x) = \frac{x + 2}{2x - 3}$

(4) $f(f(x)) = x$

(5) $x = 1$