

A2.A.42: Compositions of Functions 4: Find the composition of functions

- 1 If $f(x) = 2x - 1$ and $g(x) = 3x + 5$, then $(f \circ g)(x)$ is equal to
 - 1) $5x + 4$
 - 2) $6x + 2$
 - 3) $6x + 9$
 - 4) $6x^2 + 7x - 5$
- 2 If $f(x) = 3x - 5$ and $g(x) = x - 9$, which expression is equivalent to $(f \circ g)(x)$?
 - 1) $4x - 14$
 - 2) $3x - 14$
 - 3) $3x - 32$
 - 4) $3x^2 - 32x + 45$
- 3 If $f(x) = x^2 - 5$ and $g(x) = 6x$, then $g(f(x))$ is equal to
 - 1) $6x^3 - 30x$
 - 2) $6x^2 - 30$
 - 3) $36x^2 - 5$
 - 4) $x^2 + 6x - 5$
- 4 If $f(x) = x^2$ and $g(x) = 2x + 1$, which expression is equivalent to $(f \circ g)(x)$?
 - 1) $2x^2 + 1$
 - 2) $2(x + 1)^2$
 - 3) $4x^2 + 1$
 - 4) $4x^2 + 4x + 1$
- 5 If f and g are two functions defined by $f(x) = 3x + 5$ and $g(x) = x^2 + 1$, then $g(f(x))$ is
 - 1) $x^2 + 3x + 6$
 - 2) $9x^2 + 30x + 26$
 - 3) $3x^2 + 8$
 - 4) $9x^2 + 26$
- 6 If $f(x) = 2x^2 - 3x + 1$ and $g(x) = x + 5$, what is $f(g(x))$?
 - 1) $2x^2 + 17x + 36$
 - 2) $2x^2 + 17x + 66$
 - 3) $2x^2 - 3x + 6$
 - 4) $2x^2 - 3x + 36$
- 7 If $f(x) = \frac{2}{x+3}$ and $g(x) = \frac{1}{x}$, then $(g \circ f)(x)$ is equal to
 - 1) $\frac{1+3x}{2x}$
 - 2) $\frac{2x}{1+3x}$
 - 3) $\frac{x+3}{2}$
 - 4) $\frac{x+3}{2x}$
- 8 If $f(x) = x^2 - x$ and $g(x) = x + 1$, determine $f(g(x))$ in simplest form.
- 9 Given: $f(x) = \sqrt{2x+5}$ and $g(x) = 6x - 3$, find $g(f(10))$ and $(f \circ g)(x)$.
- 10 If $f(x) = x^{\frac{2}{3}}$ and $g(x) = 8x^{-\frac{1}{2}}$, find $(f \circ g)(x)$ and $(f \circ g)(27)$.
- 11 Which expression is equivalent to $(n \circ m \circ p)(x)$, given $m(x) = \sin x$, $n(x) = 3x$, and $p(x) = x^2$?
 - 1) $\sin(3x)^2$
 - 2) $3 \sin x^2$
 - 3) $\sin^2(3x)$
 - 4) $3 \sin^2 x$

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Answer Section

1 ANS: 3

$$2(3x + 5) - 1 = 6x + 10 - 1 = 6x + 9$$

REF: 061015b

2 ANS: 3

REF: 010909b

3 ANS: 2

$$6(x^2 - 5) = 6x^2 - 30$$

REF: 011109a2

4 ANS: 4

REF: 080917b

5 ANS: 2

REF: 080313b

6 ANS: 1

$$f(g(x)) = 2(x + 5)^2 - 3(x + 5) + 1 = 2(x^2 + 10x + 25) - 3x - 15 + 1 = 2x^2 + 17x + 36$$

REF: 061419a2

7 ANS: 3

REF: 010408b

8 ANS:

$$(x + 1)^2 - (x + 1) = x^2 + 2x + 1 - x - 1 = x^2 + x$$

REF: 081530a2

9 ANS:

$$27, \sqrt{12x - 1}$$

REF: 080341siii

10 ANS:

$$4x^{-\frac{1}{3}}, \frac{4}{3}$$

REF: 010331b

11 ANS: 2

REF: 061216a2