

NAME: _____

1. 010501b, P.I. A2.A.42
 If $f(x) = -2x + 7$ and $g(x) = x^2 - 2$, then $f(g(3))$ is equal to
 [A] -1 [B] -7 [C] 7 [D] -3
2. 010621b, P.I. A2.A.42
 If $f(x) = 5x^2 - 1$ and $g(x) = 3x - 1$, find $g(f(1))$.
3. 060921b, P.I. A2.A.42
 If $f(x) = x^2 + 4$ and $g(x) = 2x + 3$, find $f(g(-2))$.
4. 060806b, P.I. A2.A.42
 If $f(x) = x^2 + 4$ and $g(x) = \sqrt{1-x}$, what is the value of $f(g(-3))$?
 [A] $2i\sqrt{3}$ [B] 8 [C] 2 [D] 13
5. 060322b, P.I. A2.A.42
 If $f(x) = 2^x - 1$ and $g(x) = x^2 - 1$, determine the value of $(f \circ g)(3)$.
6. 010207b, P.I. A2.A.42
 If $f(x) = 5x^2$ and $g(x) = \sqrt{2x}$, what is the value of $(f \circ g)(8)$?
 [A] 16 [B] $8\sqrt{10}$ [C] 80 [D] 1,280
7. 060725b, P.I. A2.A.42
 If $f(x) = \log_2 x$ and $g(x) = 2x^2 + 14$, determine the value of $(f \circ g)(5)$.
8. 010331b, P.I. A2.A.42
 If $f(x) = x^{\frac{2}{3}}$ and $g(x) = 8x^{\frac{1}{2}}$, find $(f \circ g)(x)$ and $(f \circ g)(27)$.
9. 010909b, P.I. A2.A.42
 If $f(x) = 3x - 5$ and $g(x) = x - 9$, which expression is equivalent to $(f \circ g)(x)$?
 [A] $3x - 14$ [B] $3x^2 - 32x + 45$
 [C] $4x - 14$ [D] $3x - 32$
10. 080917b, P.I. A2.A.42
 If $f(x) = x^2$ and $g(x) = 2x + 1$, which expression is equivalent to $(f \circ g)(x)$?
 [A] $2x^2 + 1$ [B] $2(x + 1)^2$
 [C] $4x^2 + 4x + 1$ [D] $4x^2 + 1$
11. 080313b, P.I. A2.A.42
 If f and g are two functions defined by $f(x) = 3x + 5$ and $g(x) = x^2 + 1$, then $g(f(x))$ is
 [A] $9x^2 + 30x + 26$ [B] $9x^2 + 26$
 [C] $x^2 + 3x + 6$ [D] $3x^2 + 8$
12. 010408b, P.I. A2.A.42
 If $f(x) = \frac{2}{x+3}$ and $g(x) = \frac{1}{x}$, then $(g \circ f)(x)$ is equal to
 [A] $\frac{1+3x}{2x}$ [B] $\frac{x+3}{2}$
 [C] $\frac{2x}{1+3x}$ [D] $\frac{x+3}{2x}$

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13. 060417b, P.I. A2.A.42

If $f(x) = x + 1$ and $g(x) = x^2 - 1$, the expression $(g \circ f)(x)$ equals 0 when x is equal to

- [A] -2, only [B] 0 and -2
 [C] 1 and -1 [D] 0, only

14. 060210b, P.I. A2.A.42

If $f(x) = 2x^2 + 4$ and $g(x) = x - 3$, which number satisfies $f(x) = (f \circ g)(x)$?

- [A] 4 [B] 5 [C] $\frac{3}{4}$ [D] $\frac{3}{2}$

15. 010812b, P.I. A2.A.42

The accompanying tables define functions f and g .

x	1	2	3	4	5
$f(x)$	3	4	5	6	7

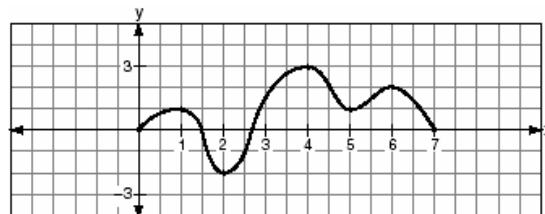
x	3	4	5	6	7
$g(x)$	4	6	8	10	12

What is $(g \circ f)(3)$?

- [A] 6 [B] 8 [C] 2 [D] 4

16. 080520b, P.I. A2.A.42

The accompanying graph is a sketch of the function $y = f(x)$ over the interval $0 \leq x \leq 7$.



What is the value of $(f \circ f)(6)$?

- [A] 0 [B] 2 [C] -2 [D] 1

17. 060526b, P.I. A2.A.42

A certain drug raises a patient's heart rate, $h(x)$, in beats per minute, according to the function $h(x) = 70 + 0.2x$, where x is the bloodstream drug level, in milligrams. The level of the drug in the patient's bloodstream is a function of time, t , in hours, according to the formula $g(t) = 300(0.8)^t$. Find the value of $h(g(4))$, the patient's heart rate in beats per minute, to the *nearest whole number*.

18. 060605b, P.I. A2.A.42

The temperature generated by an electrical circuit is represented by $t = f(m) = 0.3m^2$, where m is the number of moving parts. The resistance of the same circuit is represented by $r = g(t) = 150 + 5t$, where t is the temperature. What is the resistance in a circuit that has four moving parts?

- [A] 156 [B] 8,670 [C] 51 [D] 174

[1] B _____

[2] 11, and appropriate work is shown, such as $f(1) = 4$ and $g(4) = 11$.

[1] Appropriate work is shown, but one computational error is made.

or [1] Appropriate work is shown, but one conceptual error is made, such as solving for $f(g(1))$.

or [1] 11, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[2] incorrect procedure.

[2] 5, and appropriate work is shown.

[1] Appropriate work is shown, but one computational error is made.

or [1] Appropriate work is shown, but one conceptual error is made, such as finding

or [1] 5, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[3] incorrect procedure.

[4] B _____

[2] 255, and appropriate work is shown, such as $g(3) = 3^2 - 1$ and $f(8) = 2^8 - 1 = 255$.

[1] Appropriate work is shown, but one computational error is made.

or [1] One conceptual error is made, such as evaluating $(g \circ f)(3)$.

or [1] 255, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[5] incorrect procedure.

[6] C _____

[2] 6, and appropriate work is shown.

[1] Appropriate work is shown, but one computational error is made.

or [1] Appropriate work is shown, but one conceptual error is made, such as evaluating $(g \circ f)(5)$, resulting in an answer of 24.78270016.

or [1] 6, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[7] incorrect procedure.

[4] $(f \circ g)(x) = 4x^{-\frac{1}{3}}$ or $(8x^{\frac{1}{2}})^{\frac{2}{3}}$ or an

equivalent answer and $(f \circ g)(27) = \frac{4}{3}$ or an

equivalent answer, and appropriate work is shown.

[3] Simplification is shown to at least $4x^{-\frac{1}{3}}$, but one computational error or an error in the Law of Exponents is made when finding $(f \circ g)(27)$.

[2] $(f \circ g)(x)$ is determined correctly, but $(f \circ g)(27)$ is not found or is found incorrectly.

or [2] $\frac{4}{3}$ or an equivalent answer, and

appropriate work is shown, but an expression for $(f \circ g)(x)$ is not found or is found incorrectly.

[1] $4x^{-\frac{1}{3}}$ and $\frac{4}{3}$ or equivalent answers, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[8] incorrect procedure.

[9] D _____

[10] C _____

[11] A _____

[12] B _____

[13] B _____

[14] D _____

[15] B _____

[16] C _____

[2] 95, and appropriate work is shown.

[1] Appropriate work is shown, but one computational or rounding error is made.

or [1] Appropriate work is shown, but one conceptual error is made, such as calculating $g(h(4))$.

or [1] 95, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[17] incorrect procedure. _____

[18] D _____