

NAME: \_\_\_\_\_

*P.I. A2.A.42: Find the composition of functions*

1. Find  $g(f(x))$  where  $f(x) = x - 9$  and  $g(x) = \frac{x+2}{2}$ .

[A]  $\frac{3x-16}{2}$

[B]  $\frac{x-16}{2}$

[C]  $\frac{x-7}{2}$

[D]  $\frac{x^2-7x-18}{2}$

2. Find  $g(f(x))$  where  $f(x) = x - 5$  and  $g(x) = \frac{x-2}{7}$ .

[A]  $\frac{x^2-7x+10}{7}$

[B]  $\frac{x-37}{7}$

[C]  $\frac{8x-37}{7}$

[D]  $\frac{x-7}{7}$

3. Given  $f(x) = \frac{x+3}{x}$  and  $g(x) = x+6$ , find  $(g \circ f)(x)$  and state the domain.

[A]  $\frac{x+6}{x+9}, \{x|x \neq -9\}$

[B]  $\frac{x^2+7x+3}{x}, \{x|x \neq 0\}$

[C]  $\frac{x+9}{x+6}, \{x|x \neq -6\}$

[D]  $\frac{x^2+9x+18}{x}, \{x|x \neq 0\}$

4. Given  $f(x) = \frac{x+7}{x}$  and  $g(x) = x+3$ , find  $(g \circ f)(x)$  and state the domain.

[A]  $\frac{x+10}{x+3}, \{x|x \neq -3\}$

[B]  $\frac{x^2+4x+7}{x}, \{x|x \neq 0\}$

[C]  $\frac{x+3}{x+10}, \{x|x \neq -10\}$

[D]  $\frac{x^2+10x+21}{x}, \{x|x \neq 0\}$

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5. Given  $f(x) = -8x^2$ ,  $g(x) = -3x + 9$ , and  $h(x) = \sqrt{x}$ , find  $[(f + g) \circ h](x)$ .

[A]  $-8x - 3\sqrt{x} + 9$       [B]  $24x + \sqrt{x} + 9$

[C]  $-8\sqrt{x} - 3x + 9$

[D]  $-8x^2 - 3\sqrt{x} + 9$

6. Given  $f(x) = 7x^2$ ,  $g(x) = 8x - 3$ , and  $h(x) = \sqrt{x}$ , find  $[(f + g) \circ h](x)$ .

[A]  $7x^2 + 8\sqrt{x} - 3$       [B]  $7x + 8\sqrt{x} - 3$

[C]  $7\sqrt{x} + 8x - 3$       [D]  $56x + \sqrt{x} - 3$

7. Given  $f(x) = \frac{3}{8}x + 4$  and  $g(x) = x^3$ , find  $(g^{-1} \circ g^{-1})(19,683)$ .

[A] 3      [B] -1      [C] 4      [D] -3

8. Given  $f(x) = \frac{2}{3}x + 8$  and  $g(x) = x^3$ , find  $(f^{-1} \circ g^{-1})(-8)$ . Round to the nearest tenth.

[A] -15.0

[B] -4.2

[C] -2.9

[D] -16.3

9. Given  $f(x) = \frac{2}{7}x + 1$  and  $g(x) = x^3$ , find  $(f^{-1} \circ f^{-1})(-2)$ . Round to the nearest tenth.

10. Given  $f(x) = \frac{1}{6}x + 3$  and  $g(x) = x^3$ , find  $(g^{-1} \circ f^{-1})(-4)$ . Round to the nearest tenth.

- [1] C
- [2] D
- [3] C
- [4] A
- [5] A
- [6] B
- [7] A
- [8] A
- [9] -40.3
- [10] -3.5