

**A2.A.42: Compositions of Functions 2: Find the composition of functions**

1 If  $f(x) = \frac{1}{2}x - 3$  and  $g(x) = 2x + 5$ , what is the value of  $(g \circ f)(4)$ ?

2 If  $g(x) = \frac{1}{2}x + 8$  and  $h(x) = \frac{1}{2}x - 2$ , what is the value of  $g(h(-8))$ ?

3 If  $f(x) = -2x + 7$  and  $g(x) = x^2 - 2$ , then  $f(g(3))$  is equal to

4 If  $f(x) = 2x^2 + 1$  and  $g(x) = 3x - 2$ , what is the value of  $f(g(-2))$ ?

5 If  $f(x) = 3x^2$  and  $g(x) = \sqrt{2x}$ , what is the value of  $(f \circ g)(8)$ ?

6 If  $f(x) = 5x^2$  and  $g(x) = \sqrt{2x}$ , what is the value of  $(f \circ g)(8)$ ?

7 If  $f(x) = x^2 + 4$  and  $g(x) = \sqrt{1-x}$ , what is the value of  $f(g(-3))$ ?

8 If  $g(x) = \sqrt{x}$  and  $h(x) = x^3 - 1$ , what is  $g(h(4))$ ?

9 If  $f(x) = x - 3$  and  $g(x) = x^3$ , find  $f(g(3))$ .

10 If  $f(x) = 4x - x^2$  and  $g(x) = \frac{1}{x}$ , then  $(f \circ g)\left(\frac{1}{2}\right)$  is equal to

11 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?

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

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

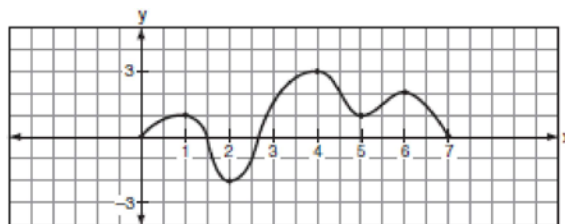
14 The accompanying tables define functions  $f$  and  $g$ .

|        |   |   |   |   |   |
|--------|---|---|---|---|---|
| $x$    | 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  $(g \circ f)(3)$ ?

15 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  $(f \circ f)(6)$ ?

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### Answer Section

1 ANS:  
3

REF: fall0902a2

2 ANS:  
5

$$h(-8) = \frac{1}{2}(-8) - 2 = -4 - 2 = -6. \quad g(-6) = \frac{1}{2}(-6) + 8 = -3 + 8 = 5$$

REF: 011403a2

3 ANS:  
-7

REF: 010501b

4 ANS:  
129

$$g(-2) = 3(-2) - 2 = -8 \quad f(-8) = 2(-8)^2 + 1 = 128 + 1 = 129$$

REF: 061503a2

5 ANS:  
48

REF: 069915siii

6 ANS:  
80

REF: 010207b

7 ANS:  
8

REF: 060806b

8 ANS:  
 $\sqrt{63}$

REF: 069423siii

9 ANS:  
24

REF: 019820siii

10 ANS:  
4

REF: 011204a2

11 ANS:  
174

REF: 060605b

12 ANS:  
0 and  $-2$

REF: 060417b

13 ANS:  
 $\frac{3}{2}$

REF: 060210b

14 ANS:  
8

REF: 010812b

15 ANS:  
 $-2$

REF: 080520b