The Weekly Rigor

No. 235 "A mathematician is a machine for turning coffee into theorems." December 22, 2018

26 Problems in Composite Functions and Interval Notation

(Part 1)

PROBLEMS

For problems 1-10, find each composite.

1. Given $f(x) = -9x + 3$ and $g(x) = x^4$, find $(f \circ g)(x)$ and $(g \circ f)(x)$.

2. Given $f(x) = 2x - 5$ and $g(x) = x + 2$, find $(f \circ g)(x)$ and $(g \circ f)(x)$.

3. Given $f(x) = x^2 + 7$ and $g(x) = x - 3$, find $(f \circ g)(x)$ and $(g \circ f)(x)$.

4. Given $f(x) = 4x + 3$ and $g(x) = x^2$, find $(f \circ g)(x)$ and $(g \circ f)(x)$.

5. Given $f(x) = x - 1$ and $g(x) = x^2 + 2x - 8$, find $(g \circ f)(x)$.

6. Given $f(x) = x + 1$ and $g(x) = x + h$, find $(f \circ g)(x)$.

7. Given $f(x) = x^2$ and $g(x) = x + h$, find $(f \circ g)(x)$.

8. Given $f(x) = \frac{1}{x}$ and $g(x) = x + h$, find $(f \circ g)(x)$.

9. Given $f(x) = \sqrt{x}$ and $g(x) = x + h$, find $(f \circ g)(x)$.

10. Given $f(x) = \frac{1}{\sqrt{x}}$ and $g(x) = x + h$, find $(f \circ g)(x)$.

For problems 11-15, evaluate each composite value.

11. If $f(x) = 3x - 5$ and $g(x) = x^2$, find $(f \circ g)(3)$ and $(g \circ f)(3)$.

12. If $f(x) = -9x - 9$ and $g(x) = \sqrt{x - 9}$, find $(f \circ g)(10)$ and $(f \circ f)(0)$.

13. If $f(x) = -4x + 2$ and $g(x) = \sqrt{x - 8}$, find $(f \circ g)(12)$ and $(f \circ f)(2)$.

14. If $f(x) = -3x + 4$ and $g(x) = x^2$, find $(f \circ g)(-2)$ and $(g \circ f)(-2)$.

15. If $f(x) = x^2$ and $g(x) = x + h$, find $(f \circ g)(x)$.

For problems 16-20, find $g(x)$.

16. Let $(f \circ g)(x) = (2x - 5)^2$ and $f(x) = x^2$. Find $g(x)$.

17. Let $(f \circ g)(x) = \sqrt{x - 5}$ and $f(x) = \sqrt{x}$. Find $g(x)$.

18. Let $(f \circ g)(x) = (5x + 1)^2 - (5x + 1)$ and $f(x) = x^2 - x$. Find $g(x)$.

19. Let $(f \circ g)(x) = \sqrt{(-3x - 2)^3}$ and $f(x) = \sqrt{x}$. Find $g(x)$.

20. Let $(f \circ g)(x) = (x + h)^2 + (x + h)$ and $f(x) = x^2 + x$. Find $g(x)$.