Comprehensive Functions Drill

The answers can be found in Part IV.

1. If $f(x) = -x^2 - 3x + 5$, then $f(-4) =$

   (A) –23
   (B) –4
   (C) 1
   (D) 9
   (E) 33

8. If $h(x) = x^2 - 3$, then $h(x + 2) =$

   (A) $x - 1$
   (B) $x^2 + 1$
   (C) $x^2 + 4$
   (D) $x^2 + 4x + 1$
   (E) $x^2 + 4x + 4$

10. If $f(x) = \dfrac{x^2 - 2x}{3}$ and $f(a) = 5$, then which of the following could be the value of a ?

    (A) –5
    (B) –3
    (C) 0
    (D) 3
    (E) 8

12. If $\square x$ is the greatest integer less than or equal to x, then what is the value of $\square(\square(\square 0.5)))$?

    (A) –2
    (B) –1
    (C) 0
    (D) 0.5
    (E) 1

15. If $f(x) = 0.7x - 2.5$ for $[-8, 3]$, then which of the following sets represents the range of f ?

    (A) $\{y: -8.1 \le y \le -4.6\}$
    (B) $\{y: -8.1 \le y \le -0.4\}$
    (C) $\{y: -5.6 \le y \le -4.6\}$
    (D) $\{y: -5.6 \le y \le 3.1\}$
    (E) $\{y: -5.6 \le y \le 4.6\}$

$$f(x) = \frac{x^2 + 3}{2}$$

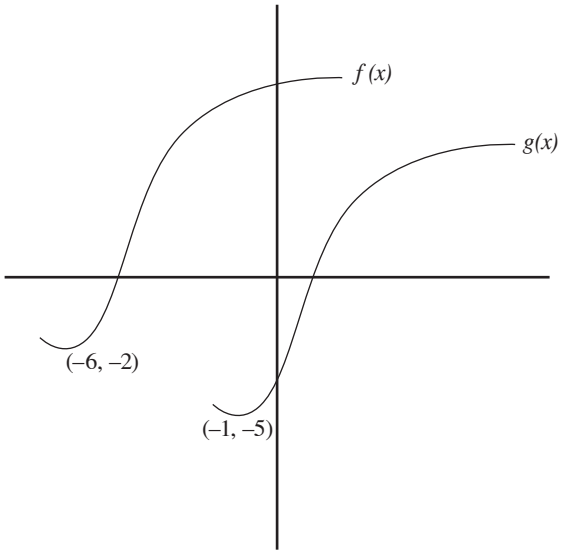
$$g(x) = 5x - 4$$

16. What is the value of $g(f(3))$?

    (A) 6
    (B) 11
    (C) 26
    (D) 62
    (E) 116

22. If $f(x) = \dfrac{(x-3)^3}{5}$ and $f(g(x)) = x$, then $g(x) =$

    (A) $5\sqrt[3]{x} - 3$
    (B) $5\sqrt[3]{x} + 3$
    (C) $\sqrt[3]{5x}$
    (D) $\sqrt[3]{5x} - 3$
    (E) $\sqrt[3]{5x} + 3$



36. The graphs of $f(x)$ and $g(x)$ are shown above. Which of the following gives the equation of $g(x)$ in terms of $f(x)$?

(A) $g(x) = f(x - 5) - 3$
(B) $g(x) = f(x + 5) - 3$
(C) $g(x) = f(x - 3) + 5$
(D) $g(x) = f(x) - 8$
(E) $g(x) = f(x - 5) + 3$

40. If $f(x) = 2x^2 + x$ and $g(x) = 3x - 1$, then what is $f(g(x))$?

(A) $6x^2 + 3x - 1$
(B) $6x^2 + 3x$
(C) $9x^2 - 6x - 1$
(D) $18x^2 - 9x - 1$
(E) $18x^2 - 9x + 1$

42. If $f(x) = \ln x$, then which of the following is the domain of $f(x)$?

(A) $\{x: x \neq 0\}$
(B) $\{x: x \leq 0\}$
(C) $\{x: x \geq 0\}$
(D) $\{x: x > -2.5\}$
(E) $\{x: x > 0\}$

48. If $f(x) = x^4 + 6x^3 - x^2 - 30x$, then which of the following is NOT a root of $f(x)$?

(A) –5
(B) –3
(C) 0
(D) 2
(E) 3