Algebra Functions Practice

Choose one answer per question. Circle A, B, C, or D.

1. Which relation has exactly one output for each of its inputs?
   A. {(0, 2), (1, 2), (2, 5)}
   B. {(0, 2), (0, 5), (2, 5)}
   C. {(0, 2), (1, 2), (1, 5)}
   D. {(0, 2), (2, 2), (2, 5)}

2. If $f(x) = x^2 + 5x - 1$, what is $f(-3)$?
   A. 23
   B. −25
   C. −7
   D. −5

3. A function has exactly these input–output pairs. (−4, 7), (0, 9), and (6, 7). What is the domain?
   A. {7, 9}
   B. {−4, 0, 6}
   C. {−4, 0, 6, 7, 9}
   D. {−4, 6}

4. A function sends 1 to 9, 2 to 4, 3 to 9, and 4 to 1. Which set is its range?
   A. {1, 2, 3, 4, 9}
   B. {1, 2, 3, 4}
   C. {4, 9}
   D. {1, 4, 9}

5. For $f(x) = 5x - 11$, which input gives the output 9?
   A. −2/5
   B. 4
   C. −4
   D. 20

6. Let $f(x) = x + 8$ and $g(x) = 3x - 2$. What is $f(g(2))$?
   A. 12
   B. 28
   C. 4
   D. 10

7. For the original function $f(x) = ((x - 7)(x + 4))/(x - 7)$, which real input must still be excluded after simplifying?

A. Every input between -4 and 7
B. -4
C. Both -4 and 7
D. 7

8. Which describes the real inputs for $h(x) = \sqrt{(4 - 3x)}$?

A. $x < 4/3$
B. $x \geq 4/3$
C. $x \leq 4/3$
D. All real x

9. Let $f(x) = 4x - 6$. Which rule reverses f for every real number?

A. Add 6, then divide by 4.
B. Divide by 4, then add 6.
C. Subtract 6, then divide by 4.
D. Multiply by 4, then add 6.

10. If $f(x) = (x + 5)^2 - 4$ for every real x, which values can f(x) take?

A. All real values strictly greater than -4
B. All real values at least 5
C. All real values no greater than -4
D. All real values at least -4

11. Let $f(x) = \sqrt{(x - 1)}$ and $g(x) = 3 - 2x$. What is the largest real input allowed for f(g(x))?

A. 3/2
B. 2
C. 1
D. No largest input

12. A function maps 1 to 6 and 2 to 9. Which additional mapping keeps the resulting function one-to-one?

A. 3 maps to 6
B. 3 maps to 8
C. 3 maps to 9
D. 2 maps to 8

13. The function $f(x) = (x - 3)^2 + 2$ is restricted to $x \le 3$. If $y = f(x)$, which expression recovers x for every $y \ge 2$?

A. $\sqrt{(y - 2)} - 3$
B. $3 + \sqrt{(y - 2)}$
C. $2 - \sqrt{(y - 3)}$
D. $3 - \sqrt{(y - 2)}$

14. Let $f(x) = x - 3$ and $g(x) = x^2$. For which real x does $f(g(x)) = g(f(x))$?

A. 2
B. -2
C. 1
D. 3

15. An invertible function satisfies $f(2) = 7$, $f(4) = 5$, and $f(6) = 9$. A second function satisfies $g(2) = 6$, $g(4) = 2$, and $g(6) = 4$. What is $g(f^{-1}(f(g(2))))$?

A. 5
B. 2
C. 4
D. 9