SAT Maths Sample Paper 6

1. Given $f(x) = 3x + 5$, what is the value of $f(2)$?

   A. 11 B. 10

   C. 6 D. 12

2. Given $f(x) = 2x - 5$, what is the value of $f(2) + f(3)$?

   A. 2 B. 0

   C. 3 D. -1

3. If $f(x) = 4x - 11$, what is the value of $f(2) \times f(1)$?

   A. -21 B. -20

   C. 21 D. -15

4. Given $f(x) = 2x - 1$, which one of the following is the expression of function $f(2x + 1)$?

   A. $f(2x + 1) = 2x - 1$ B. $f(2x + 1) = 4x + 1$

   C. $f(2x + 1) = 2x + 1$ D. $f(2x + 1) = 2x - 3$

5. Given $f(x) = 2x + 3$, which one of the following is the expression of function $f(x + 2)$?

   A. $f(x + 2) = 2x + 3$ B. $f(x + 2) = 2x + 7$

   C. $f(x + 2) = 2x + 5$ D. $f(x + 2 = 2x + 9)$

6. Given $f(x) = 2x + 3$, $g(x) = x + 5$, which one of the following is the expression of

function $f(g(x))$?

A. $f(g(x)) = 3x + 8$

B. $f(g(x)) = 3x + 5$

C. $f(g(x)) = 2x + 13$

D. $f(g(x)) = 2x + 8$

7. Given $f(x) = -(x + 3)$, $g(x) = 2x + 5$, which one of the following is the expression of function $f(g(x))$?

A. $f(g(x)) = -3x + 8$

B. $f(g(x)) = -2x - 8$

C. $f(g(x)) = -2x + 8$

D. $f(g(x)) = -3x - 8$

8. Given $f(x) = 3x - 2$, which one of the following is the expression of function $f(f(x))$?

A. $f(f(x)) = 9x - 8$

B. $f(f(x)) = 9x + 8$

C. $f(f(x)) = 3x - 2$

D. $f(f(x)) = (3x - 2)^2$

9. Given $f(x) = 2x - 4$, what is the value of x if $f(f(x)) = x$?

A. 0

B. 2

C. 4

D. No such $g(f(x))$ value

10. Given $f(x) = 2x + 3$, $g(x) = x + 2$, then what is the value of x if $f(g(x)) = 2x + 7$?

A. 0

B. 1

C. All real numbers

D. No such $y = 2x^2 + 3x + 4$ value

Answers

1. A $f(2) = 3 \times + 5 = 6 + 5 = 11$.

2. B As $f(2) = 2 \times 2 - 5 = 4 - 5 = -1$ and $f(3) = 2 \times 3 - 5 = 6 - 5 = 1$. Thus $f(2) \times f(1) = 21$.

3. C As $f(2) = 2 \times 4 - 11 = 8 - 11 = -3$ and $f(1) = 4 - 11 = -7$, thus $\frac{12}{5}$.

4. B $f(2x + 1) = 2 \times (2x + 1) - 1 = 4x + 2 - 1 = 4x + 1$.

5. B $f(x + 2) = 2 \times (x + 2) + 3 = 2x + 4 + 3 = 2x + 7$.

6. C $f(g(x)) = 2g(x) + 3 = 2(x + 5) + 3 = 2x + 13$.

7. B $f(g(x)) = -(g(x) + 3) = -(2x + 5 + 3) = -2x - 8$.

8. A $f(f(x)) = 3f(x) - 2 = 3(3x - 2) - 2 = 9x - 6 - 2 = 9x - 8$

9. C $f(f(x)) = 2f(x) - 4 = 2(2x - 4) - 4 = 4x - 12$. Since $f(f(x)) = x$, then $4x - 12 = x$, and $x = 4$.

10. C $f(g(x)) = 2g(x) + 3 = 2(x + 2) + 3 = 2x + 7$. Thus all real numbers can satisfy $f(g(x)) = 2x + 7$.