

LAKSHYA (JEE)

Relations and Functions

DPP-04

1. The domain of the function $\frac{x^2 + 8x + 9}{x^2 - 9x + 20}$ is
 (A) \mathbb{R} (B) $\mathbb{R} - \{9\}$
 (C) $\mathbb{R} - \{20\}$ (D) $\mathbb{R} - \{4, 5\}$
2. Range of $f(x) = \frac{3}{2-x^2}$ is
 (A) $\left(-\infty, \frac{3}{2}\right]$ (B) $(-\infty, 0] \cup \left[\frac{3}{2}, \infty\right[$
 (C) $(-\infty, 0] \cup \left[\frac{3}{2}, \infty\right)$ (D) $\left(-\infty, \frac{2}{3}\right]$
3. Range of $f(x) = |x - 2|$
 (A) $(-\infty, \infty)$ (B) $(-\infty, 2]$
 (C) $[0, \infty)$ (D) $(-2, 2]$
4. Range of function $\frac{1}{2 - \sin 3x}$ is
 (A) $[1, 3]$ (B) $\left[\frac{1}{3}, 1\right]$
 (C) $(1, 3)$ (D) $\left(\frac{1}{3}, 1\right)$
5. A real valued function $f(x)$ satisfies the functional equation.
 $f(x - y) = f(x)f(y) - f(a - x)f(a + y)$
 where a is given constant and $f(0) = 1$, $f(2a - x)$ is equal to
 (A) $-f(x)$ (B) $f(x)$
 (C) $f(a) + f(a - x)$ (D) $f(-x)$
6. Let $\sum_{k=1}^{10} f(a+k) = 16(2^{10} - 1)$ where the function f satisfies $f(x + y) = f(x)f(y)$ for all natural numbers x, y and $f(1) = 2$. Then the natural number 'a' is
 (A) 2 (B) 16
 (C) 4 (D) 3
7. If $f: \mathbb{R} \rightarrow \mathbb{R}$ satisfies $f(x+y) = f(x) + f(y)$, for all $x, y \in \mathbb{R}$ and $f(1) = 7$, then $\sum_{r=1}^n f(r)$ is
 (A) $\frac{7n(n+1)}{2}$ (B) $\frac{7n}{2}$
 (C) $\frac{7(n+1)}{2}$ (D) $7n + (n+1)$
8. A function $f(x)$ is given by $f(x) = \frac{5^x}{5^x + 5}$, then the sum of the series $f\left(\frac{1}{20}\right) + f\left(\frac{2}{20}\right) + f\left(\frac{3}{20}\right) + \dots + f\left(\frac{39}{20}\right)$ is equal to:
 (A) $\frac{39}{2}$ (B) $\frac{19}{2}$
 (C) $\frac{49}{2}$ (D) $\frac{29}{2}$
9. The domain of the function $f(x) = \log_{3+x}(x^2 - 1)$ is
 (A) $(-3, -1) \cup (1, \infty)$
 (B) $[-3, -1) \cup [1, \infty)$
 (C) $(-3, -2) \cup (-2, -1) \cup (1, \infty)$
 (D) $[-3, -2) \cup (-2, -1) \cup [1, \infty)$
10. If $a + \alpha = 1$, $b + \beta = 2$ and $af(x) + af\left(\frac{1}{x}\right) = bx + \frac{\beta}{x}, x \neq 0$, then value of the expression $\frac{f(x) + f\left(\frac{1}{x}\right)}{x + \frac{1}{x}}$ is _____.

ANSWERS

1. (D)
2. (C)
3. (C)
4. (B)
5. (A)
6. (D)
7. (A)
8. (A)
9. (C)
10. (2)



Note - If you have any query/issue

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