MATHS

BOOKS - JEE MAINS PREVIOUS YEAR

RELATIONS AND FUNCTIONS

Others

1. The largest interval lying in $\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$ for which the function $\left[f(x) = 4^{-x} \hat{} 2 + \cos^{-1}\left(\frac{x}{2} - 1\right) + \log(\cos x)\right]$ is defined, is (1) $[0, \pi]$ (2) $\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$ (3) $\left[-\frac{\pi}{4}, \frac{\pi}{2}\right)$ (4) $\left[0, \frac{\pi}{2}\right)$

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2. If the function $f: R \backslash \{0\} \rightarrow$ given by $f(x) = \frac{1}{x} - \frac{2}{e^{2x} - 1}$ is continuous at $x = 0$, then find the value of $f(0)$

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3. Let $f: N \to Y$ be a function defined as $f(x) = 4x + 3$, where $Y = \{y \in N: y = 4x + 3 \text{ for some } x \in N\}$. Show that f is invertible and its inverse is

(1) $g(y) = \frac{3y + 4}{3}$

(2) $g(y) = 4 + \frac{y + 3}{4}$

(3) $g(y) = \frac{y + 3}{4}$

(4) $g(y) = \frac{y - 3}{4}$

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4. Let R be the real line. Consider the following subsets of the plane $R \times R$. $S = \{(x, y): y = x + 1 and 0 < x < 2\}, T = \{(x, y): x - y$ is an integer $\}$.

Which one of the following is true?

(1) neither S nor T is an equivalence relation on R

(2) both S and T are equivalence relations on R

(3) S is an equivalence relation on R but T is not

(4) T is an equivalence relation on R but S is not

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5. Consider the following relations: R = {(x, y) | x, y are real numbers and x = wy for some rational number w};

$S = \left\{ \left(\frac{m}{n}, \frac{p}{q} \right) \mathrm{m}, \mathrm{n}, \mathrm{pandqa\ r\ ei\ n\ t\ e\ g\ e\ r\ ss\ u\ c\ ht\ h\ a\ tn}, q \neq 0 \mathrm{andq\ m} =$

. Then

(1) neither R nor S is an equivalence relation

(2) S is an equivalence relation but R is not an equivalence relation

(3) R and S both are equivalence relations

(4) R is an equivalence relation but S is not an equivalence relation

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6. The domain of the function $f(x) = \frac{1}{\sqrt{|x| - x}}$ is:

(A) $(-\infty, \infty)$

(B) $(0, \infty$

(C) $(-\infty, 0)$

(D) $(-\infty, \infty)$-$\{0\}$

A. $(-\infty, \infty)$~$\{0\}$

B. $(-\infty, \infty)$

C. $(0, \infty)$

D. (-oo,0)`

Answer: null

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7. If g is the inverse of a function f and $f'(x) = \frac{1}{1+x^5}$, then g'(x) is equal to

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8. The sum of all real values of x satisfying the equation $\left(x^2-5x+5\right)^{x^2+4x-60}=1$ is: (1) 3 (2) -4 (3) 6 (4) 5

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9. The function $f:\overrightarrow{R-\frac{1}{2},\frac{1}{2}}$ defined as $f(x)=\frac{x}{1+x^2}$, is : Surjective but not injective (2) Neither injective not surjective Invertible (4) Injective but not surjective

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