

## MATHS

## **BOOKS - JEE MAINS PREVIOUS YEAR ENGLISH**

**RELATIONS AND FUNCTIONS** 

## Others

1. The largest interval lying in  $\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$  for which the function  $\left[f(x) = 4^{-x} \cdot 2 + \cos^{-1}\left(\frac{x}{2} - 1\right) + \log(\cos x)\right]$  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  $f: R \setminus \{0\}^{\rightarrow}$  given by  $f(x) = \frac{1}{x} - \frac{2}{e^{2x} - 1}$  is continuous at x = 0, then find the value of f(0)



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  $R \times R$ .  $S = \{(x, y) : y = x + 1 and 0 < x < 2\}, T = \{(x, y) : x - y \text{ is an integer }\}$ . 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:  $R = \{(x, y) \mid x, y \text{ are real numbers and } x \}$ 

= wy for some rational number w};  $S = \left\{ \left(\frac{m}{n}, \frac{p}{q}\right) m, n, pandqa r ei n t e g e r ss u c ht h a tn, q \neq 0 andq m + 0 an$ 

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

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**9.** The function 
$$f: R - \frac{1}{2}, \frac{1}{2}$$
 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