

India's Number 1 Education App

MATHS

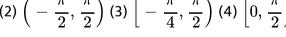
BOOKS - JEE MAINS PREVIOUS YEAR

RELATIONS AND FUNCTIONS

Others

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

(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 $f: R \setminus \{0\}^{\longrightarrow}$ given by $f(x) = \frac{1}{x} - \frac{2}{x^{2x} + 1}$ is continuous at x=0, then find the value of f(0)

3. Let $f\!:\!N o Y$ be a function defined as f(x)=4x+3 , where

$$Y=\{y\in N\colon\! y=4x+3 ext{ for some } x\in N\}$$
 . Show that f is invertible and

its inverse is

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

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

(3)
$$g(y)=rac{y+3}{4}$$

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



4. Let R be the real line. Consider the following subsets of the plane

$$R imes R$$
 . $S = \{(x,y) \colon y = x + 1 and 0 < x < 2\}, T = \{(x,y) \colon x - y \; ext{ is }$

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};
- $S = \left\{ \left(rac{m}{n}, rac{p}{a}
 ight)$ m , n , pandqa r ei n t e g e r ss u c ht h a tn , $ext{q}
 eq 0$ andq m =
 - (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) $(-\infty,\infty)$

. Then

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

(B) $(0, \infty)$

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

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

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

$$\mathsf{C}.\left(0,\infty
ight)$$

Answer: null

equal to



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

- **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 $f:R-\frac{1}{2},\frac{1}{2}$ 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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