

FUNCTION

Q.1. Find domain of the following functions:

(i) $f(x) = \sqrt{\frac{1-5^x}{7^{-x}-7}}$

(ii) $f(x) = \sqrt{\log_{0.4}\left(\frac{x-1}{x+5}\right)}$

(iii) $f(x) = \log_e\left(\log_{|\sin x|}(x^2-8x+23) - \frac{3}{\log_2|\sin x|}\right)$

(iv) $f(x) = \frac{1}{\sqrt{[x]^2 - 7[x] + 6}}$; where $[.]$ represents

G.I.F.

Q.3. Solve for x :

(i) $\left|\frac{x}{x-1}\right| + |x| = \left|\frac{x^2}{x-1}\right|$

(ii) $[x] = x^2 - 1$

(iii) $4\{x\} = x + [x]$

(iv) $\sin x = [1 + \sin x] + [1 - \cos x]$

Where $[.]$ represents G.I.F.

Q.2. Find the range of the following functions :

(i) $f(x) = \frac{\{x\}}{1+\{x\}}$; where $\{.\}$ represents

fractional part of x

(ii) $f(x) = \sin^2 x - 5\sin x + 6$

(iii) $f(x) = \ln(3x^2 - 4x + 5)$

(iv) $f(x) = \log_3\left(\log_2(x^2 + 4x + 4)\right)$

Q.4. Check whether function is either even, odd or neither even nor odd

(i) $f(x) = \ln\left(\frac{1-x}{1+x}\right)$

(ii) $f(x) = \frac{x(a^x - 1)}{a^x + 1}$

(iii) $f(x) = \ln(x + \sqrt{1+x^2})$

(iv) $f(x) = (\ln(\sec x + \tan x))^3$

(v) $f(x) = \frac{x(\tan x + \sin x)}{\left[\frac{x+\pi}{\pi}\right] - \frac{1}{2}} (x \neq n\pi)$

where $[.]$ represents G.I.F.