

Q. Solve for x :

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

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

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

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

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

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

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

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

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

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

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

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

Q. If $f(x) = \begin{cases} x+1 & ; & x < 0 \\ x^2 & ; & x \geq 0 \end{cases}$ and $g(x) = \begin{cases} x^3 & x < 1 \\ 2x-1 & x \geq 1 \end{cases}$

Find

(i) $f \circ g(x)$

(ii) $g \circ f(x)$

(iii) $f(x) + g(x)$

(iv) $g(x^2)$

(v) $(f(x))^4$

Q. If $f(x) = x^2$; $g(x) = \sin x$; $x \in \mathbb{R}$

solve for x :

$f \circ g \circ g \circ f(x) = g \circ g \circ f(x)$

Q. Let $f(x) = \frac{x}{(1+x^n)^{1/n}}$; $n \geq 2$

$g(x) = \underbrace{(\text{fofof.....of})}_{n \text{ times}}(x).$

Find $g(x)$