

Open Mind Guruji

Function: Lecture 05

Q.1 State whether odd or even

$$f(x) = \frac{a^x + a^{-x}}{2}$$

→ given

$$f(x) = \frac{a^x + a^{-x}}{2} \quad \text{--- (1)}$$

Put $x = -x$ in eq (1)

$$f(-x) = \frac{a^{(-x)} + a^{-(-x)}}{2}$$
$$= \frac{a^{-x} + a^x}{2}$$
$$f(-x) = f(x)$$

∴ given function is even

if $f(-x) = f(x)$ then even
if $f(-x) = -f(x)$ then odd



Q.3. Test whether function odd or even

$$f(x) = 3x^4 - 2x^2 + \cos x$$

→ given

$$f(x) = 3x^4 - 2x^2 + \cos x \quad \text{--- (1)}$$

Put $x = -x$ in eq (1)

$$f(-x) = 3(-x)^4 - 2(-x)^2 + \cos(-x)$$

$\cos(-x) = \cos x$

$$f(-x) = 3x^4 - 2x^2 + \cos x$$
$$\therefore f(-x) = f(x)$$

∴ given function is even

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Function: Lecture 05

Q. 5

$$f(x) = 4x^4 + 3\cos x + x \sin x + 1$$

Show $f(x)$ is even function.

→ given

$$(-2) \times (-3) = 6$$

$$f(x) = 4x^4 + 3\cos x + x \cdot \sin x + 1 \quad \text{--- (1)}$$

Put $x = -x$ in eq (1)

$$f(-x) = 4(-x)^4 + 3\cos(-x) + (-x) \cdot \sin(-x) + 1$$
$$= 4x^4 + 3 \cdot \cos x + [(-x) \cdot (-\sin x)] + 1$$

$$f(-x) = 4x^4 + 3\cos x + x \cdot \sin x + 1$$

$$f(-x) = f(x)$$

