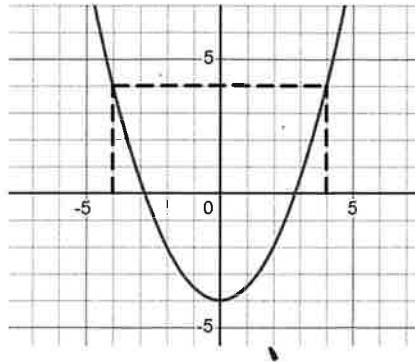## Symmetry

An **even function** is **symmetric about the y-axis.** It satisfies
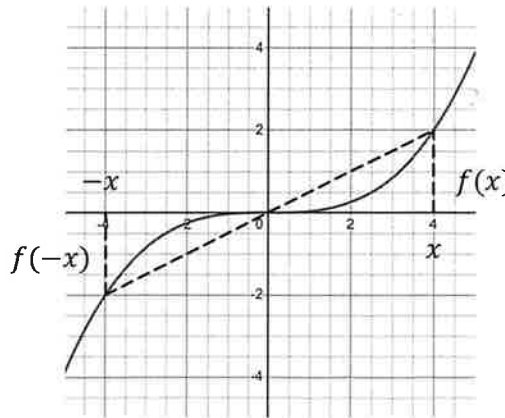
$$f(-x) = f(x)$$

for all x in its Domain.

An **odd function** is **symmetric about the origin.** It satisfies

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

for all x in its Domain.

Ex 1.   Determine whether each function is even, or odd, or neither.

a) $f(x) = x^6$

b) $g(x) = x^3 + \dfrac{1}{x}$

Solution 1.

a)

$$f(-x) = (-x)^6$$

$$f(-x) = x^6$$

$$\boxed{\text{Even}}$$

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

b)

$$g(-x) = (-x)^3 + \left(\frac{1}{-x}\right)$$

$$= (-1)x^3 + \left(\frac{1}{x}\right)(-1)$$

$$= -1\left(x^3 + \frac{1}{x}\right)$$

$$g(-x) = -g(x)$$

$$\boxed{\text{odd}}$$

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