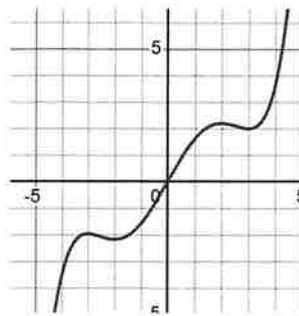


**Exercise 2**

1. State whether the functions of the following graphs are even, odd, or neither.

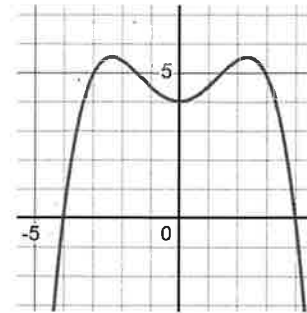
a)

odd  
Symmetric about the origin



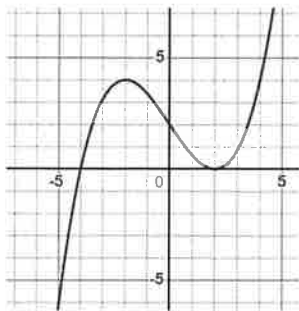
b)

Even  
Symmetric about the y-axis



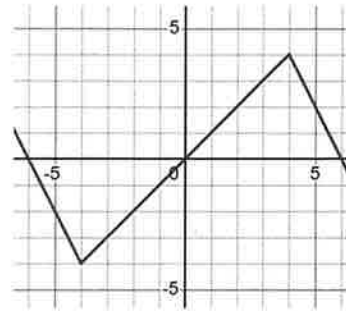
c)

Neither



d)

odd  
Symmetric about the origin



2. Determine whether the function is even, odd, or neither.

a)  $f(x) = x^2$

Even

$f(-x) = (-x)^2$

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

c)  $g(x) = x^2 + x^3$

$g(-x) = (-x)^2 + (-x)^3$

$= x^2 - x^3$

neither

b)  $f(x) = x^3$

$f(-x) = (-x)^3$

odd

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

d)  $g(x) = \frac{2}{x^4 + 1}$

$g(-x) = \frac{2}{(-x)^4 + 1} = \frac{2}{x^4 + 1}$

Even

e)  $h(x) = (x + x^5)^3$

$h(-x) = (-x + (-x)^5)^3$

$= (-x - x^5)^3$

odd

f)  $h(x) = x^6(1 + x - x^2)$

$h(-x) = (-x)^6(1 + (-x) - (-x)^2)$

$h(-x) = x^6(1 - x - x^2)$

neither

g)  $y = |x|$

$y = |-x| = x$

Even

h)  $y = \frac{x^3}{x^4 + x^2 + 1}$

$y = \frac{(-x)^3}{(-x)^4 + (-x)^2 + 1} \rightarrow -\frac{x^3}{x^4 + x^2 + 1}$

odd