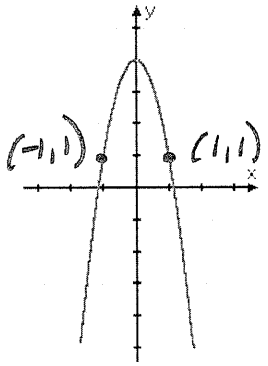
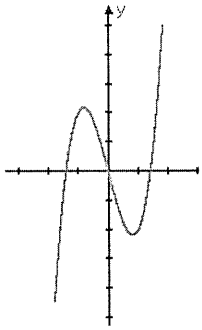
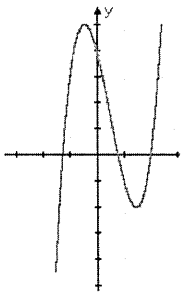
Pre-Calculus Sec 3-4: Even, Odd, or Neither Name_____

a) $y = -3x^2 + 4$ b) $y = 2x^3 - 4x$ c) $y = 2x^3 - 3x^2 - 4x + 4$







1) According to the graph, does each function appear to be even, odd, or neither. Explain.

a) $f(x) = f(-x)$ EVEN - REFLECT OVER Y-AXIS; SYMMETRIC ABOUT Y-AXIS

b) $f(-x) = -f(x)$ ODD - SYMMETRIC ABOUT ORIGIN

c) NEITHER - DOES NOT REFLECT OVER Y OR ROTATE 180° ABOUT ORIGIN

2) Algebraically, show that the functions are even, odd, or neither.

a) EVEN $f(x) = f(-x)$

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

$-3x^2 + 4$ $= -3x^2 + 4$

YES - EVEN

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

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

$= -3x^2 + 4 \neq 3x^2 - 4$

NOT ODD

b) EVEN $f(x) = f(-x)$

$f(x) = 2x^3 - 4x$ $f(-x) = 2(-x)^3 - 4(-x)$

$2x^3 - 4x \neq -2x^3 + 4x$

NOT EVEN

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

$f(-x) = 2(-x)^3 - 4(-x)$ $-f(x) = -(2x^3 - 4x)$

$-2x^3 + 4x = -2x^3 + 4x$

YES - ODD

c) EVEN $f(x) = f(-x)$

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

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

$= -2x^3 - 3x^2 + 4x + 4$

$f(x) \neq f(-x)$

NOT EVEN

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

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

$= -2x^3 - 3x^2 + 4x + 4$

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

$= -2x^3 + 3x^2 + 4x - 4$

$f(-x) \neq -f(x)$ NOT ODD

NEITHER