

W5 – 1.3 – Symmetry in Polynomial Functions

MHF4U

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1) Determine whether each function is even, odd, or neither. Does it have line symmetry about the y -axis, point symmetry about the origin, or neither?

a) $y = x^4 - x^2$

b) $y = -2x^3 + 5x$

c) $y = -4x^5 + 2x^2$

d) $y = x(2x + 1)^2(x - 4)$

e) $y = -2x^6 + x^4 + 8$

2) State whether each function is even or odd. Verify algebraically.

a) $f(x) = x^4 - 13x^2 + 36$

b) $g(x) = 6x^5 - 7x^3 - 3x$

3) Use the given graph to state:

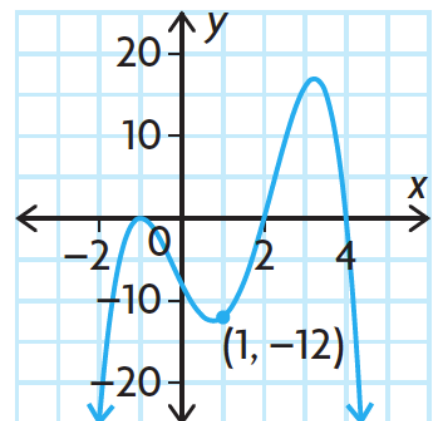
a) x -intercepts

b) number of turning points

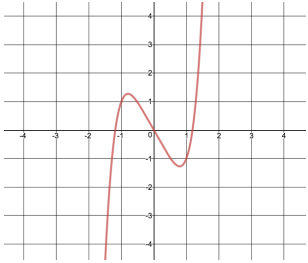
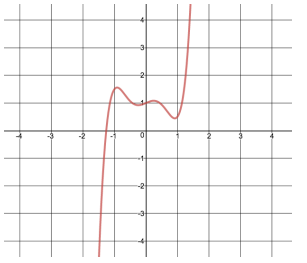
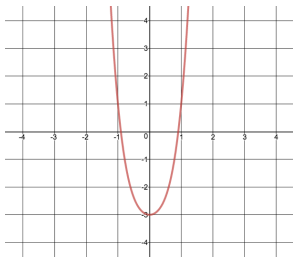
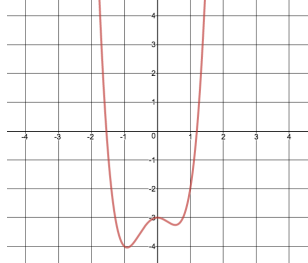
c) least possible degree

d) any symmetry present; even or odd function?

e) the intervals where $f(x) < 0$



4) Label each function as even, odd, or neither

ANSWER KEY

1) **a)** even, line symmetry about y -axis **b)** odd, point symmetry about origin **c)** neither

d) neither **e)** even, line symmetry about y -axis

2) **a)** even, $f(-x) = f(x)$ **b)** odd, $f(-x) = -f(x)$

3) **a)** -1 (order 2), 2, and 4 **b)** 3 **c)** 4 **d)** no symmetry, neither **e)** $X \in (-\infty, -1) \cup (-1, 2) \cup (4, \infty)$

4) odd, neither, even, neither