

MHF4U**3.2 Characteristics of Polynomial Functions**

1. Find if the following polynomial functions are odd or even.

a) $f(x) = 1 - x^2$

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

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

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

e) $f(x) = (x^2 + 1)^2(x^3 + x)$

2. Analyse the end behaviour of each polynomial function.

a) $f(x) = -2x^3 + 3x - 1$

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

c) $f(x) = (1 - x^2)(x^3 + 1)$

d) $f(x) = x(1 - 2x)^2$

3. If $P(x)$ is even and $Q(x)$ is odd, what can you say about the following compositions? Are they odd or even? Explain. Find examples to prove you are right.

a) $f(x) = P(x) + Q(x)$

a) $g(x) = P(x)Q(x)$

4. Use Desmos to compare the graph of the following functions. How many turning points are there?

a) $f(x) = x^4$

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

c) $f(x) = x^4 + x^3$

d) $f(x) = x^4 + x^2$

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

f) $f(x) = x^4 + x$

g) $f(x) = x^4 - x$