

3.2 Characteristics of Polynomial Functions



Math Learning Target:

"I can identify properties of any polynomial function."

A **leading coefficient** is the coefficient of the term with the highest exponent for powers of x in the polynomial expression or function.

For example, 4 is the leading coefficient in the polynomial function:

$$f(x) = -2x + 7 + 4x^3$$

A **turning point** is a point on a curve where the relation changes from increasing to decreasing, and vice versa. (For an example see p. 30)

An **absolute maximum** is synonymous with global maximum.

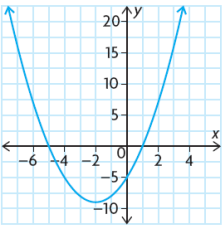
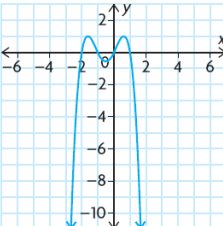
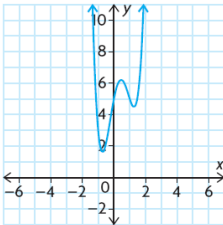
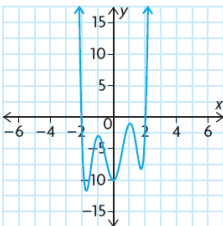
An **absolute minimum** is synonymous with global minimum.

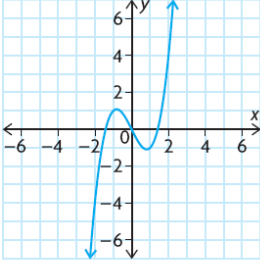
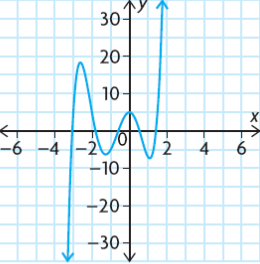
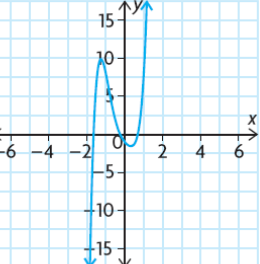
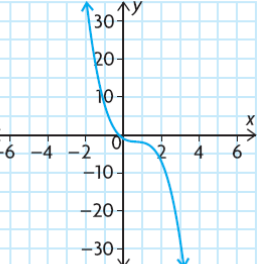
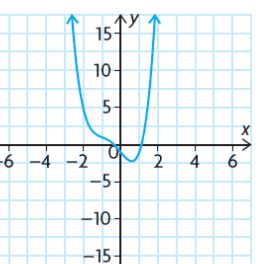
(For an example see p. 131)

INVESTIGATE the Math. pp. 129-131 **A-E and G-M.** Use [desmos](https://www.desmos.com)

A chart for parts A and E has already been created for you.

Answer the rest of the questions in your notebook.

A.	Degree	Even or Odd Degree	Leading Coefficient	End Behaviours		Number of turning points
				$x \rightarrow \infty$	$x \rightarrow -\infty$	
a)						
	$f(x) = x^2 + 4x - 5$					
b)						
	$f(x) = -x^4 - 7x^3 + x^2 + 7x$					
c)						
	$f(x) = 3x^4 - 4x^3 - 4x^2 + 5x + 5$					
d)						
	$P(x) = 2x^6 - 12x^4 + 18x^2 + x - 10$					

	Degree	Even or Odd Degree	Leading Coefficient	End Behaviours		Number of turning points
				$x \rightarrow -\infty$	$x \rightarrow +\infty$	
e)						
	$f(x) = x^3 - 2x$					
f)						
	$f(x) = 2x^5 + 7x^4 - 3x^3 - 18x^2 + 5$					
g)						
	$f(x) = 5x^5 + 5x^4 - 2x^3 + 4x^2 - 3x$					
h)						
	$f(x) = -2x^3 + 4x^2 - 3x - 1$					
i)						
	$f(x) = x^4 + 2x^3 - 3x - 1$					

E.	<u>Even Functions</u>	<u>Odd Functions</u>	Neither
i) $f(x) = x^4 - 2x^2 + 1$			

Read and **STUDY** p.135

Complete pp. 136-138 #1ab, 2ab, 3, 4abf, 5, 7ad, 10, 13, 14, 16