Name: _____ Date: _____

Learning Goal 3.1	Graphing and the characteristics of a graph (e.g. degree, extrema, zeros, end-behaviour).

Terminology

Degree	**Leading Coefficient**	**Constant**

Example A polynomial function is a function that can be written in the form

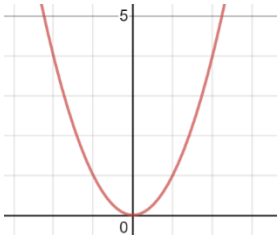
$$f(x) = a_n x^n + a_{n-1}x^{n-1} + a_{n-2}x^{n-2} + \ldots + a_2 x^2 + a_1 x + a_0,$$

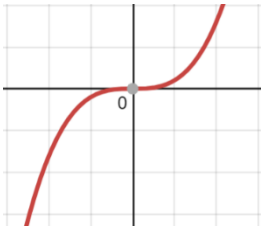
where n is a whole number, x is a variable, the coefficients a_n to a_0 are real numbers. Which of the following functions are polynomials? For those that are polynomial functions, state the **degree**, the **leading coefficient**, and the **constant term**.

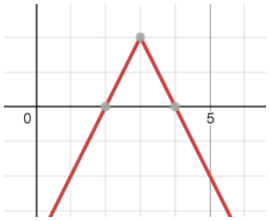
Function	**Type of Function**	**Degree**	**Leading Coefficient**	**Constant term**
a. $g(x) = \sqrt{x} + 5$				
b. $h(x) = 2x^3 - 4x + \sqrt{8}$				
c. $f(x) = 3x^4$				
d. $k(x) = 3^x + 11$				
e. $f(x) = x - 7$				
f. $y = -0.2$				
g. $g(x) = 5 + 4x + \frac{1}{x}$				
h. $y = 2x^3 + 3x^2 - 4x - 1$				
i. $f(x) = \frac{2}{3}x^4 - 5x^3 - 12x + 0.56$				
j. $y = 3x^{-2} + 4x^2 - 6$				

Assignment p. 114 #1 – 8, 10, 11, C2, C4 Quiz Next Day!

End behaviour or $\lim_{x \to \pm\infty} f(x)$







Example Use DESMOS to graph each of the following polynomial functions and complete the table:

	$g(x) = -x^4 + 10x^2 + 5x - 4$	$f(x) = x^3 + x^2 - 5x + 3$
Polynomial Type		
End Behaviour		
Domain		
Range		
Number of $x-$ intercepts		
$y-$ intercept		
Maximum and/or Minimum Values		

Example The x −intercepts of the graph of a function are the **zeros of the function**. We can find the zeros the function by graphing the function and determining the x −intercepts. Approximate the zeros of the function $f(x) = x^4 - 15x^2 + 20$ (to nearest tenth).