

Assignment #2A – Polynomial Power!

[30 marks]

Assignment Objective

- Complete 4 or 6 “A” Questions [K/U, 8 marks]
- Complete 3 of 4 “B” Questions [ATIPS, 12 marks]
- Complete 1 of 2 “C” Questions [C, 5 marks]
- An additional 5 marks will be awarded based on how well your solutions are presented. [C, 5]

If you complete extra questions in “A” or “B”, you will be give the “best of” marks.
Do not complete more than one “C” question. If you do, I will mark the first one in the assignment, and ignore the second.

Part A: That’s a Fact(orial)! [K/U, 2 marks each]

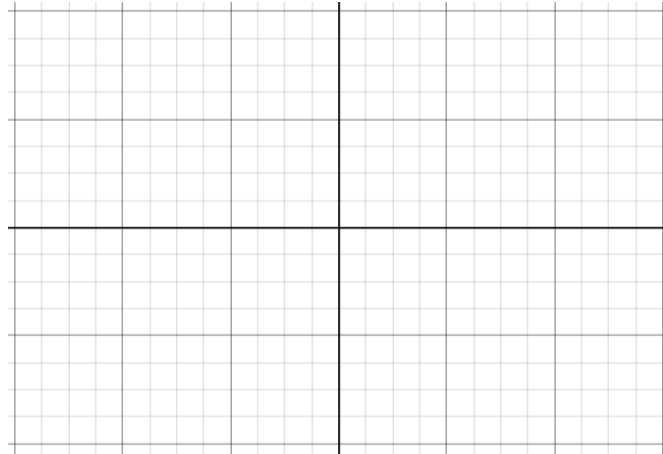
1. Determine the equation of a line with a slope of _____ and that passes through the point (_____ , _____).
2. Determine the vertex of the quadratic $y =$ _____.
3. State the degree, leading coefficient, and end-behaviours of the function
 $p(x) =$ _____
4. Draw a rough sketch of a polynomial function that is _____ degree, has a _____ leading coefficient, and a _____ root.
5. Given the polynomial function $d(x) =$ _____, state (a) which finite difference is constant and (b) the value of this finite difference.
6. Sketch the graph of $f(x) =$ _____ .

Part B: The First Difference is the Biggest One [ATIPS, 4 marks each]

1. Landen is standing at the bottom of a hill. He throws a football up the hill.
The height (h) of the hill x meters in front of Landen is $h =$ _____.
The height (h) of the ball x meters from Landen is $h =$ _____.
Determine how many meters away from Landen the ball lands, and how high up the ball is.

2. Given the table of values below, determine the degree and the leading coefficient of the polynomial function.

x	y
-3	
-2	
-1	
0	
1	
2	
3	



3. Given the graph, determine the equation of the function $q(x)$. (Sketch it on the grid above.)
4. The table below shows the horsepower needed for an aircraft to reach a particular speed.
- Use differences to determine the most appropriate type of model for this data.
 - Use linear regression (Desmos) to determine a model for this relationship.
 - Use your model to determine the horsepower needed to reach 800km/h.

Air Speed (km/h)	Horsepower (hp)
0	0
100	
200	
300	
400	
500	

Part C: Bad Habits? End that Behaviour! [C, 5 marks]

- Create some kind of presentable material that illustrates the **key features of polynomial functions** - intercepts, end behaviour, and symmetry. You can create anything you like – poster, powerpoint, comic strip – so long as it explains each process.
- Investigate functions with negative exponents. Use Desmos to look at the graphs of $y = x^{-1}$, $y = x^{-2}$, $y = x^{-3}$, etc. up to $y = x^{-6}$. Make rough sketches of each function, noting intercepts, asymptotes, symmetry, and end behaviour. Summarize your findings in a table.