

Assignment #2A – Work you Quad(ratic)s

[30 marks]

Assignment Objective

- Complete 4 of 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]
- You will also receive a mark based on how well you present your solutions [C, 5 marks].

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

Part A: Sketch *This Curve* [K/U, 2 marks each]

For questions 1-3, sketch the graph, and identify the vertex, y-intercept, x-intercept, and the axis of symmetry.

1. $y =$

2. $y =$

3. $y =$

For questions 4 – 6, expand and simplify.

4. $(\quad)(\quad)$

5. $(\quad)(\quad)$

6. $(\quad)^2$

Part B: My Italian Friend eats Soup and Pasta with a Pair'a Bowl'as!

1. A rectangle has dimensions such that the length is one more than twice the width.
 - a) Determine a simplified expression for the area of the rectangle, in terms of the width.
 - b) Calculate the area of the rectangle when the width is _____ units.
 - c) Use Desmos to graph your model for area.
 - d) Use Desmos to determine the width that gives a rectangle with an area of _____ units².
2. A parabola has a vertex at the point (\quad , \quad). Determine equations for two possible parabolas that pass through this vertex, in standard form. (Hint: don't *start* with standard form, but finish with it.)
3. Expand and simplify: $(\quad)(\quad)(\quad)(\quad)$

4. One night, while doing his/her homework, a particularly frustrated MPM 2D student hurls his/her binder out their 2nd story bedroom window. The table shown tracks the height of the binder for the first second it's airborne.

	<u>Time (s)</u>	<u>Height (m)</u>
	0	
	0.2	
a) How high above the ground is the window?	0.4	
b) Plots the points on a grid, and use them to sketch a curve of best fit.	0.6	
c) At what time does the binder hit the ground?	0.8	
d) Determine an equation for the relationship between time and height. Write your final answer in standard form.	1.0	

Part C: Four Rodents Glued Together Make a Quad-Rat (ick!) [C, 5 marks]

1. Create some kind of presentable material that explains the **key features of a quadratic graph**. It can be anything you want – poster, powerpoint, poem, pickle sculpture – so long as it can reasonably explain the concept. Points will be awarded for accuracy of information [3 marks], creativity [1] and polish [1].
2. We've seen a couple of “degree two” graphs now – parabolas and circles. We (briefly) mentioned two other types – hyperbolas and ellipses (ovals). Pick **one** of the latter two, and do a little research to find:
 - a) The general form of the equation [2 marks],
 - b) How to sketch the graph from the equation, with an example [2 marks], and
 - c) An example of something that this relationship can model.