IM1 Problem Set 48

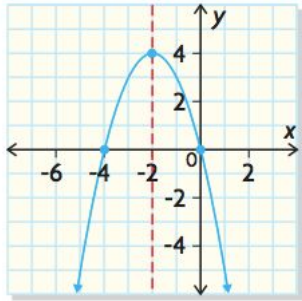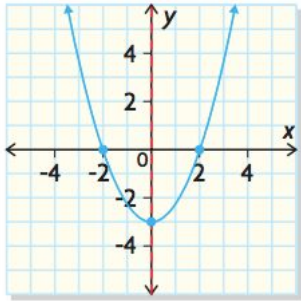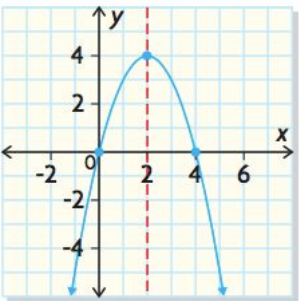| Task 1	Task 2	DC
Put solutions to problems from the previous Problem Set on the board	Discuss all problems and come to a consensus. Record solutions in your notebooks and present solutions.	DC

Problem Set 48

48.1	Use your calculator and a standard view window to graph and analyze the following functions: (Your analysis will include the domain, range, asymptotes (if any), and x- and y-intercepts (if any))

<div align="center">

a. $f(x) = 2x - 4$ b. $f(x) = 2^x - 4$ c. $f(x) = x^2 - 4$

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48.2	For the function $f(x) = x^2$, prepare a data table and then graph the data and draw a smooth curve through the data points you have generated from the function.

x	-4	-3	-2	-1	0	1	2	3	4
$f(x)$									

Then determine:
- a. the domain and the range of $f(x)$;
- b. the vertex of the curve;
- c. is the curve symmetrical? Where might the axis of symmetry be?

48.3	Expand and simplify the following polynomial expressions:

- a. $2x(3x + 1) + 5(3x + 1)$
- b. $x(x + 5) - 6(x + 5)$
- c. $3(2x^2 - 1) + 6(2x - 3) - (2x^2 - 5x)$

48.4	A football is kicked into the air. Its height above the ground is approximated by the relation $h(t) = 20t - 5t^2$, where h is the height in meters and t is the time since the football was kicked.

- a. What are the zeroes (x-intercepts) and what do they represent?
- b. What are the coordinates of the vertex? What does this point represent?
- c. Sketch the relation into your notes, labeling the key points.
- d. What would be the domain and range of this relation?

48.5	For each graph, state the *y*-intercept, the zeroes, the coordinates of the vertex and the equation of the axis of symmetry a) b) c)

48.6	A company that manufactures cell phones uses the function $P(x) = 120x - 6x^2$ to model its profits. The variable *x* represents the number of thousands of cell phones sold and the variable *P* represents the profit in thousands of dollars.
	
	   a. What does the point (5,450) mean in the context of this question?
	   b. What is the maximum profit that the company can earn?
	   c. How many cell phones must the company sell to "break even" (meaning the profit is zero)?
	   d. What would be a reasonable domain and range for this function in this context?

48.7	Given the function $y = -x^2 - 2x + 3$, use your calculator to help answer the following questions about this quadratic relation
	
	   a. Create a table of values, using the *x* values of {-4,-3,-2,-2,0,1,2,3,4}.
	   b. Determine the equation of the axis of symmetry.
	   c. Find the coordinates of the vertex.
	   d. Find the coordinates of the zeros.
	   e. Find the y-intercepts.
	   f. Determine the maximum OR minimum value.

48.8	Fun times today and thanks for your participation and efforts in this situation. As requested, I am putting the video of the recorded lesson into our shared google folder ==> (address link below) https://drive.google.com/drive/folders/12SwzmIuNrofSFnJxpHtQ67tCcCTp7LSN Second item is how I want the problem sets submitted. Here is a set of instructions for submitting Problem Sets ==> they need to be scanned into pdf form (NO PHOTOS) ==> Go to any APP store and get the FREE app like "Scanbot," or "Camscanner". I have downloaded Scanbot . Then use your phone to take pictures of your work using the SCAN APP and make sure to export it as ONE pdf.