Rising Math III – Summer Review Problems

- Solve part I in June, part II in July, part III in August.
  The idea of the review is to do little work (each of these 3 packets should take about 3 hours of work), but spread in time so it refreshes your memory every now and then and keeps alive the knowledge you acquired during the year. Of course, you can do everything in August, but by then your memory will be stale beyond the rejuvenating power of this packet. Or you can do it all now, but by late August, when classes begin, you will have trouble to retrieve this knowledge from the dungeons of your memory. If you want to invest your time poorly, go ahead.

- If you solved a problem and the solution can be checked using your calculator, by all means do it. Moreover, consider the checking-with-your-calculator thing part of the problem.

- You have hints for most of the groups of problems. Use them wisely: try to work out the problem on your own first. If you see that you cannot, go to the hints. And, if you solved the problem but your calculator seems to have a different opinion about the solution, in that case too, go for the hints. Or if your solution should be Baltimore and you got Alaska, in that case too, use the hints.

- Work hard at resolving discrepancies. Not so hard that it mars your vacation (intelligence includes having a sense of proportion).

- You know that we value your explanations. Make sure you include them.

- If a problem or group thereof is still driving you crazy, you will find help at rvilarrubi@barrie.org. USE IT! Be explicit about what you did, what you got, and/or what you find puzzling. A couple of sentences. You may include a scan in your email. Help may delay a day or two.

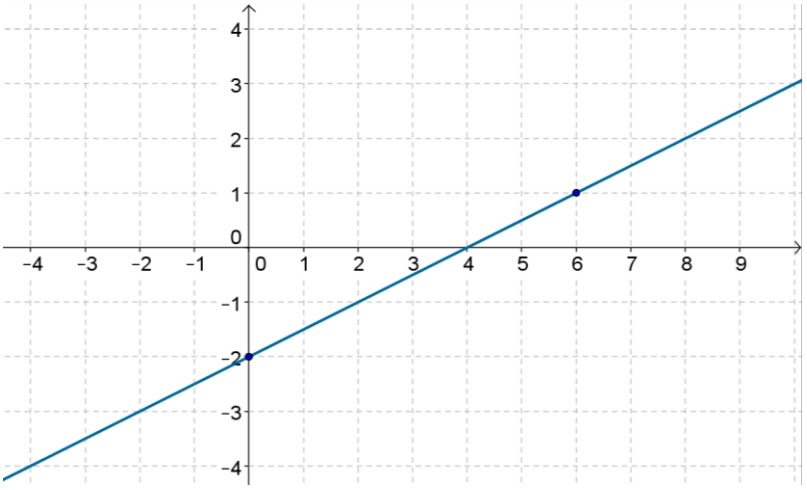
- Turn in the packet with your solutions the first day of classes. It will be a conversation piece the first week of class, and part of your first trimester grade.

- Enjoy your vacation!

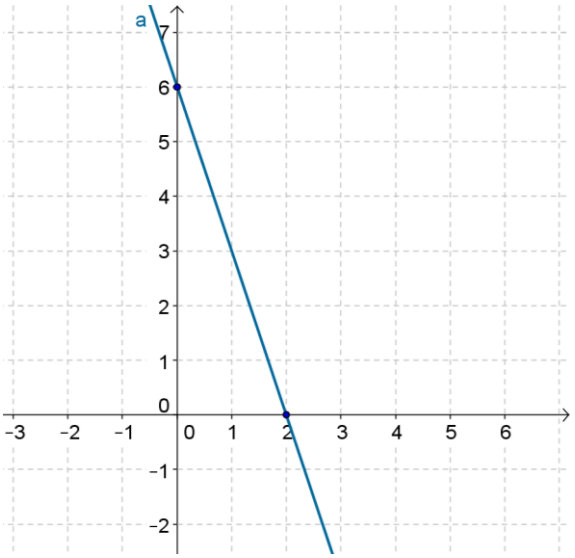
Review Problems for June

Problem 1 Find a rule of each of the lines below

1a.



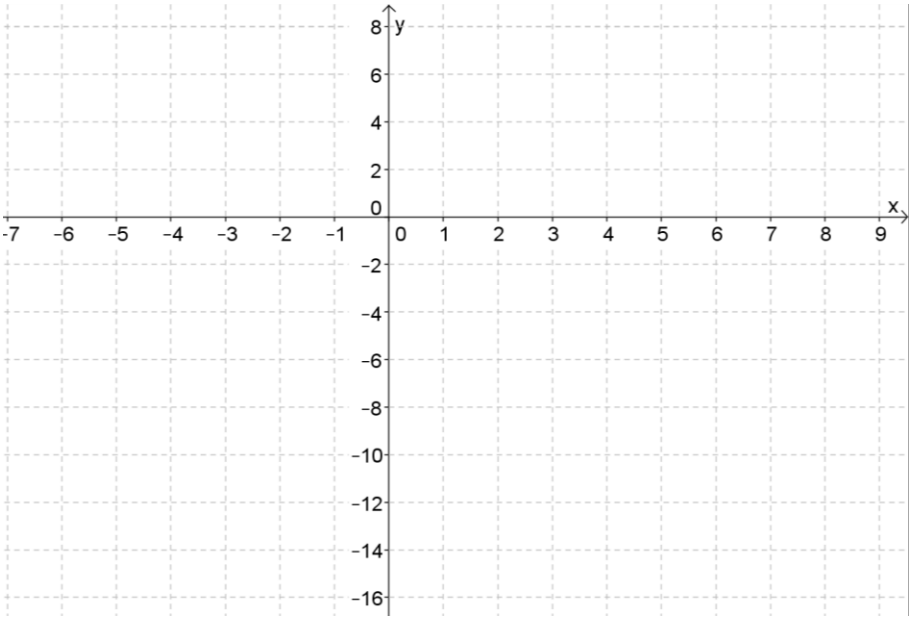
1b.



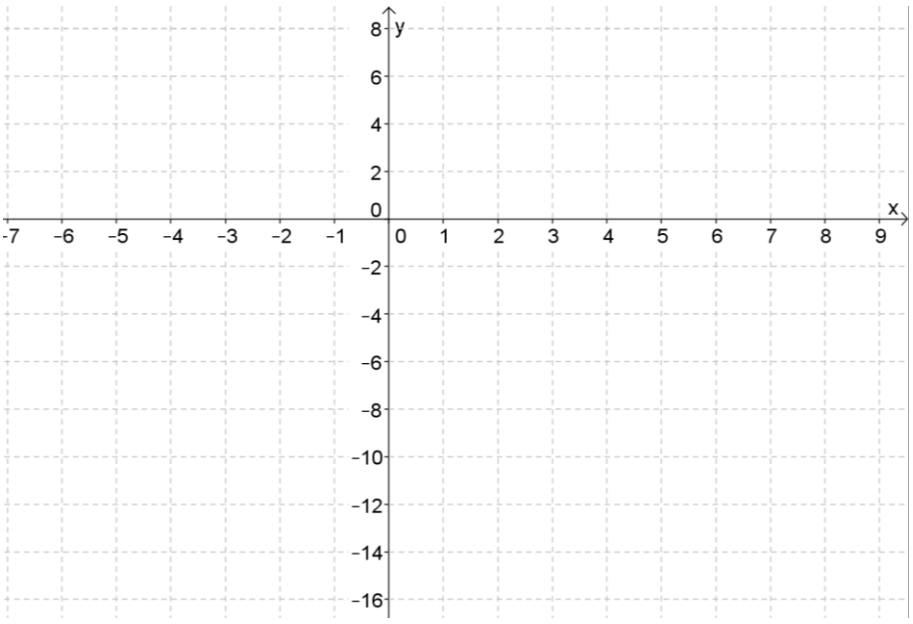
Problem 2 Graph each of the following quadratic functions without the aid of technology. Your work should include

- Determining if the graph smiles or frowns
- Find the x-intercepts, if any, and plot and label them
- Find the coordinates of the vertex and plot and label it

2a. $f(x) = x^2 - 2x - 15$



2b. $f(x) = -2x^2 - 12x - 16$



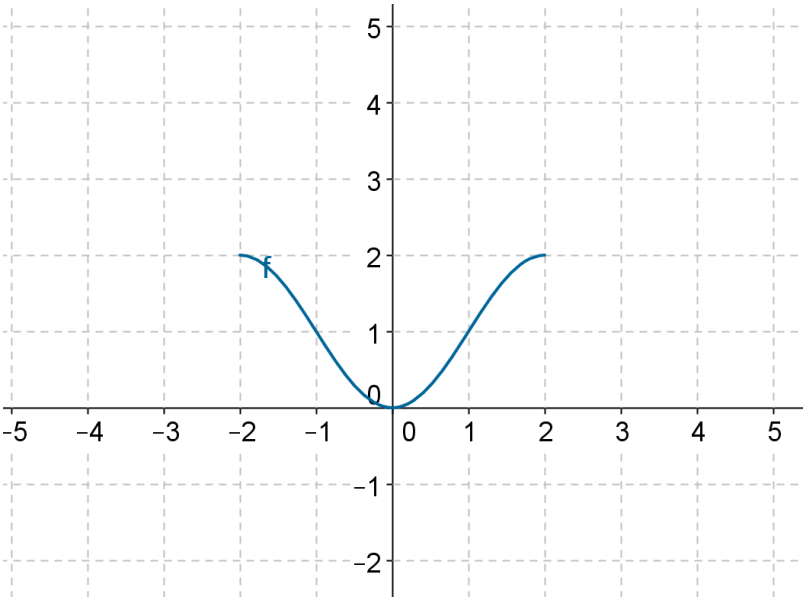
Problem 3 Solve the equations below without the aid of technology

3a. $(x-5.3)(x+2.2)\left(x^2-4\right)=0$

3b. $3(x-4.7)^2-75=0$

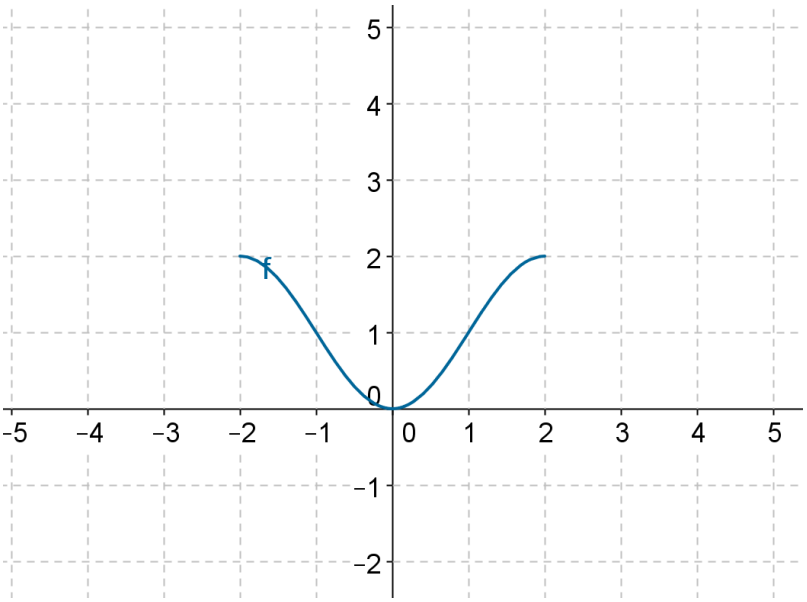
3c. $(2x + 1)(x - 4) = (x - 2)^2 + 10$

Problem 4 The graph of a function $g(x)$ is shown below

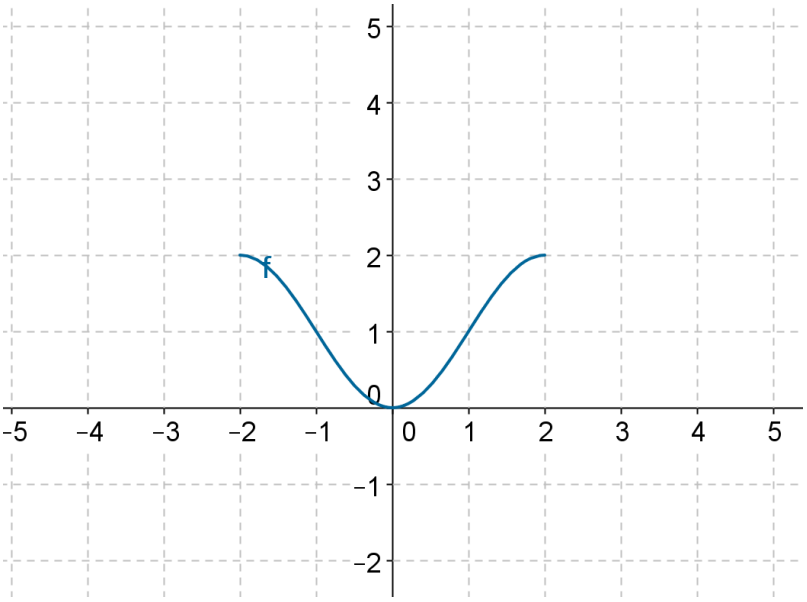


In each of the following cases, you will have a function related to g. Sketch its graph

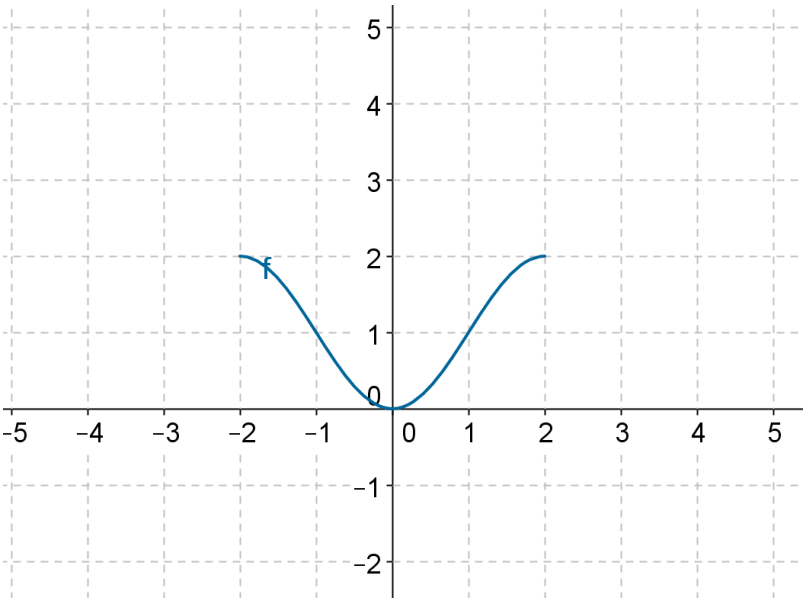
4a. $f(x) = g(x - 3)$



4b. $h(x) = -g(x) + 5$



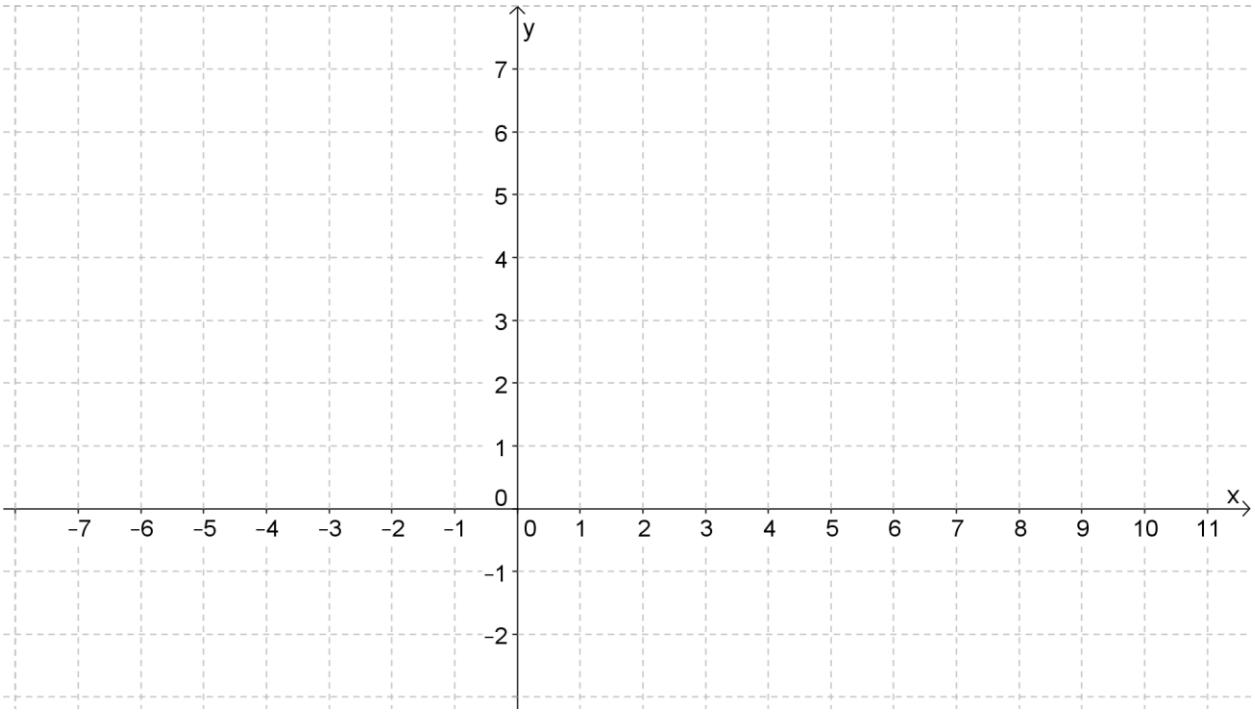
4c. $k(x) = 2g(x)$



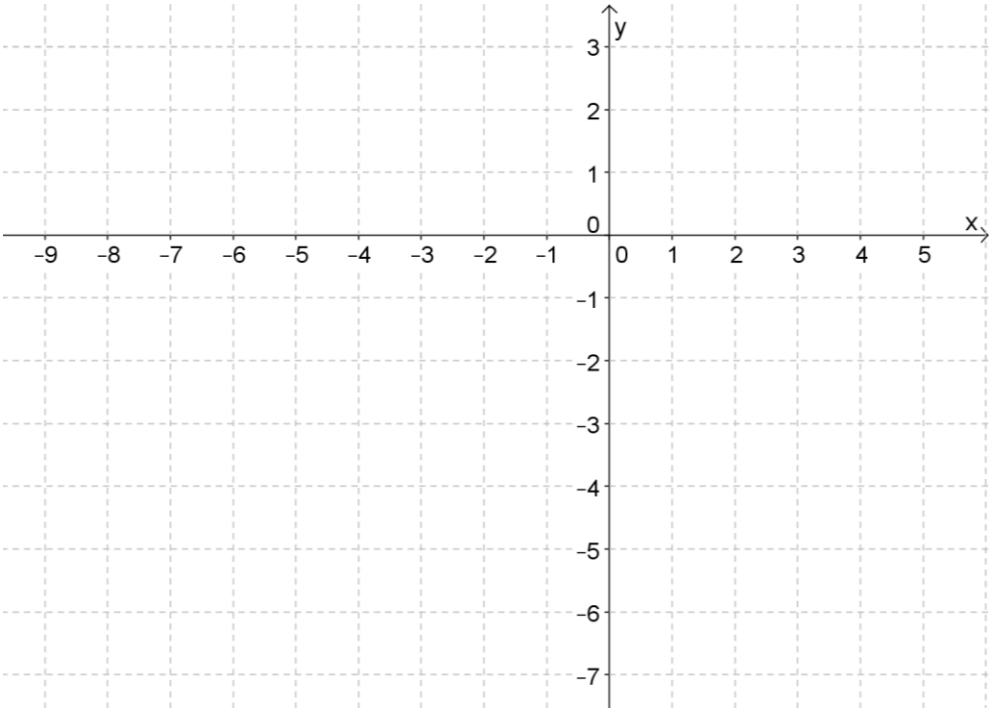
Review Problems for July

Problem 1 Sketch the graph of the functions below without the aid of technology. Your graph should include vertex, x-intercepts if any, and y-intercept.

1a. $g(t) = 0.5(t-3)^2 - 2$



1b. $f(x) = -2(t+1)^2 - 3$



Problem 2 A teacher purchased one gallon of milk (128 oz) at the supermarket, of which she consumes 7.5 oz every day.

2a. Set M_n = amount of milk left in oz. *n* days after the purchase. What is the meaning of M_0? What is its value?

2b. Find a recursive formula for M_n. (START and NOW/NEXT)

Problem 3 The equation $x^2 - 16x + c = 0$ has exactly one solution. Find the value of *c*.

Problem 4 This year for ESW, the school visited Belize, a country with a population of 390 thousand and an annual growth rate of 1.8% . Assume this rate remains constant.

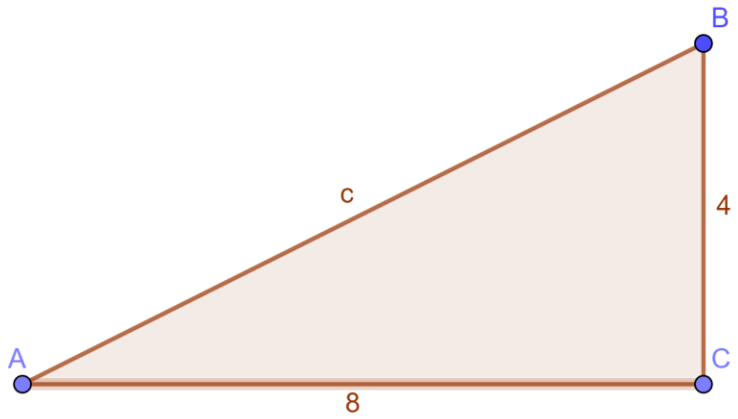
4a. Write a rule for $P(t)$ = the population of Belize t years from now (2019)

4b. Use the recursion feature on your calculator to find $P(5)$

4c. What is the meaning of the number you got?

4d. Use the graphing features of your calculator to find in what year the population of Belize will reach 450 thousand

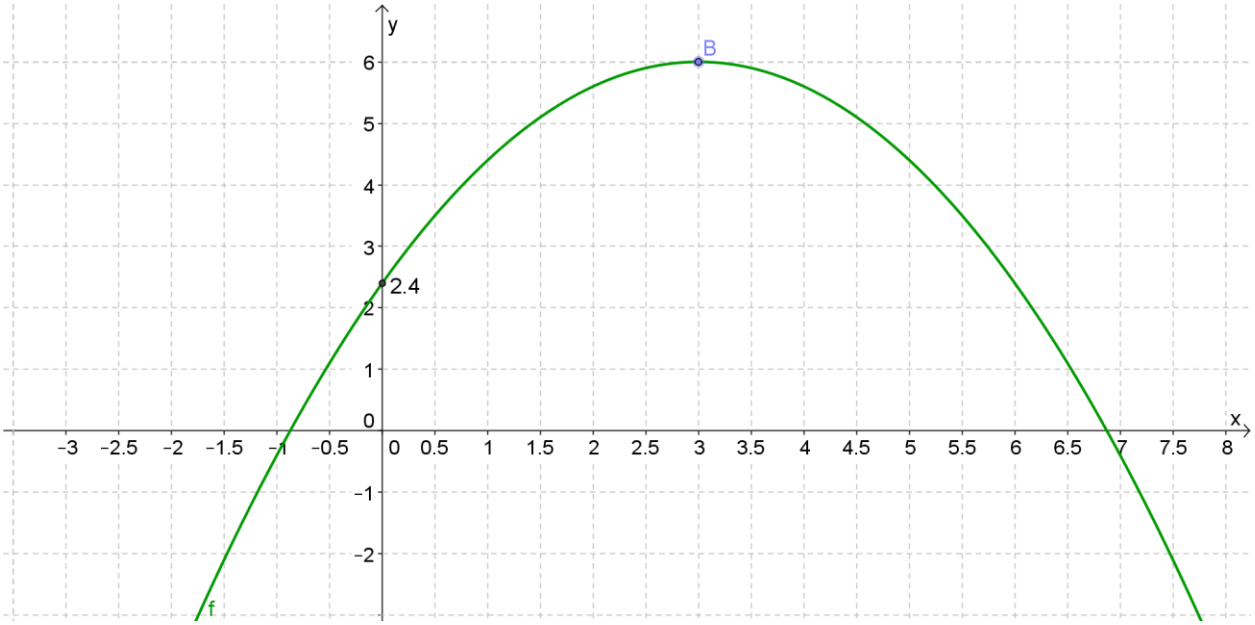
Problem 5 The angle of the triangle below at C is right. Find the length c.



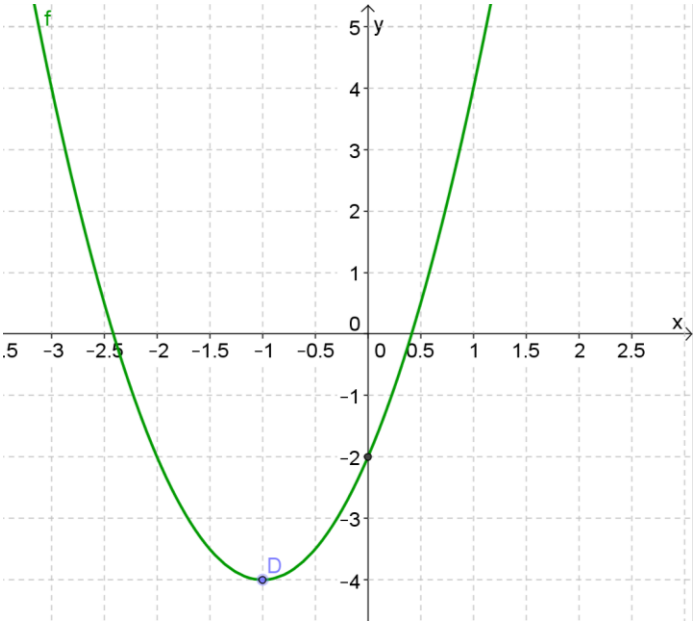
Review Problems for August

Problem 1 Find a plausible rule for each of the functions graphed below

1a.



1b.



Problem 2 You will need a graphin calculator for this problem. A small, heavy object is dropped from the top of the One World Trade Building, 541 meters above the ground

2a. Find the rule of the function $h(t)$ = height in meters of the object *t* seconds after it is released.

2b. How long will it take for the object to reach the ground?

2c. A second object is dropped 3 seconds later. Find the rule of the function $k(t)$ = height in meters of the object *t* seconds after ***the first object*** is released. Find a rule for *k*.

Problem 3 Reduce to a single exponential

Reduce to one single exponential:

3a. $\dfrac{b^{m} \cdot b}{b^{3}}$

3b. $(x^{3})^{n-1} \cdot \dfrac{1}{x^{n-2}}$

3c. $\dfrac{e^{-x}\sqrt{e}}{e^{x-1}}$

Problem 4 Years after college, Terry starting playing pro basketball. When she faced a two free throw situation, she would score the first throw 80% of the times and, if she scored the first throw, she would go on to score the second in 90% of the cases. If she misses the first, she would get the second in 70% of the cases,

4a. Make a tree to describe the situation and calculate the probability that in a two free throw situation, she would score

2 pts

1 point

0 points

Problem 5 A player in a TV show s playing a game that consisted of rolling a die repeatedly. If the result is

6, she would get $12,

if it is 2-5, she collects the number of dollars on the die,

if it is 1, she loses all of the money she has accumulated playing the game

She can stop playing whenever she wants

Suppose that she has already accumulated $20.

5a. Should she continue playing? Explain

5b. When should she stop playing?