Practice Test 3
BUSA130

This exam is graded out of 15 points. You **may not use a calculator** on Part I. You have 25 minutes to complete Part I. You must do all problems in Part I. You may use the remaining 65 minutes to complete Part II. You may use a calculator on Part II. You must do 4 of the 5 problems in Part II. Do not do all problems in Part II.

Part I

1) For the function given by the equation below, find the domain, y-intercept, x-intercept(s), vertical and horizontal asymptotes (if any exist), relative maxima/minima (if any exist), intervals on increase/decrease, points of inflection (if any exist), and intervals of concavity up/down. (4pts)

$$f(x) = -\frac{2}{1-x}$$

2) Solve the equations below. (1pt each)

- $\left(\frac{1}{4}\right)^{2-4x} = 4^{2x^2}$

- $\log_x x = 2$

- $\log 100^x - \ln 1^2 = 0$

Part II

1) On day t a new Amazon warehouse worker can pack x boxes to be shipped according to the table below. Find the point of inflection. Describe what this point of inflection means for a new trainee. (2pts)

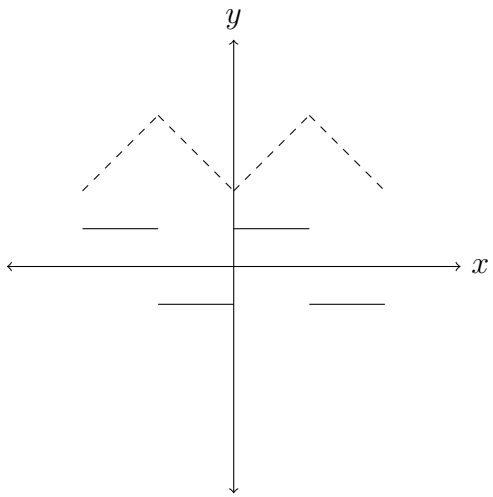
Day	Number of Boxes Packed
1	50
2	60
3	71
4	83
5	94
6	104
7	109
8	112
9	113
10	114

2) Find any local extrema of the function $f(x) = x^2 + x + 1$. Are any of these local extrema global? Why? (2pts)

3) A farmer wants to maximize the number of peaches she gets from her 10 acre orchard. She knows that, for every unit increase in the number of trees planted per acre, the number of peaches per tree decreases by 5. She also knows that when there are 30 trees per acre, the average number of peaches per tree is 200. How many trees should she plant per acre to maximize the number of peaches she harvests? What is the maximum number of peaches she can harvest? (2pts)

4) Solve the equation for x: $12 - e^{-0.4x} = 3$.

5) In the two graphs below, which function is the **first** derivative of the other? Is the dotted function the derivative of the solid function? Or is the solid function the derivative of the dotted function?



Bonus: There will be a bonus question worth 0.5pts.