Math 120 (Pezzoli) Name _____

Fall 2019

Midterm #2 TA:_____

. Section:_____

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Instructions:

- Your exam contains 3 problems.

- Your exam should contain 4 pages; please make sure you have a complete exam.

- Box in your final answer.

- Unless stated otherwise, you **MUST** show work for credit. No credit for answers only. If in doubt, ask for clarification.

- Your work needs to be neat and legible.

- You are allowed one 8.5×11 sheet of notes (both sides).

- The only calculator allowed is the Ti-30x IIS.

- Round off your final answers to 2 decimal places, unless you are asked for exact answers.
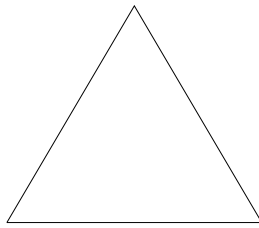
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Problem #1 (10 pts) _____
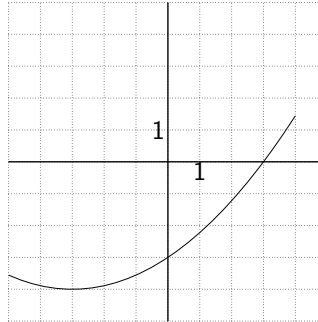
Problem #2 (12 pts) _____

Problem #3 (13 pts) _____

TOTAL (35 pts) _____

1

1. You want to build two enclosures using exactly 3000 feet of fencing. One enclosure will be an equilateral triangle, the other a square. What should the side of the square be in order to minimize the area of the two combined enclosures ?

2

2. The function f graphed below has domain $-5 \le x \le 4$

a) What is the value of $f(f(0))$?

$f(-3) = -4$

b) What is the domain of $f\left(\frac{x}{2}\right)$?

$-10 \le x \le 8$

The next two questions are unrelated to parts a), b) above. Consider the function $g(x) = 2(x-1)^2 + 4$.

c) Write a formula for the function whose graph is the graph of g shifted horizontally to the right of two units, then reflected across the y axix, then shifted vertically up of three units .

d) Let $h(x)$ be the function you obtain by restricting $g(x)$ to the domain $x \le 0$ Find a formula for $h^{-1}(y)$, the inverse of $h(x)$, and find the domain of $h^{-1}(y)$.

DOMAIN $=$

3

3. John invested $ 1,000 in 2015. Mary invested $ 1,000 in 2016.

   Assume both investments grow exponentially. John 's investment increases 3 % every two years. Mary's doubles every 15 years. When will Mary have three times as much money invested as John ? Give the answers in years (Ex: in the year 2040)

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