

Math 120 A - Autumn 2014
Mid-Term Exam Number Two
November 13, 2014

Name: _____

Student ID no. : _____

Signature: _____

Quiz Section (AA/AB/AC/AD): _____

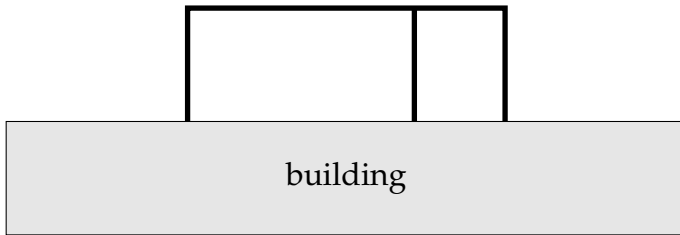
1	10	
2	10	
3	10	
4	10	
Total	40	

- Complete all four questions.
- Show all work for full credit.
- You may use a scientific calculator during this examination. Graphing calculators are not allowed. Also, other electronic devices are not allowed, and should be turned off and put away for the duration of the exam.
- If you use a trial-and-error or guess-and-check method when an algebraic method is available, you will not receive full credit.
- You may use one hand-written 8.5 by 11 inch page of notes. Write your name on your notesheet and turn it in with your exam.
- You have 50 minutes to complete the exam.

1. There were 10000 monkeys on Island X in 1930. In 1945, there were 12000 monkeys on the island. In 1935, there were half as many parrots as monkeys on the island. The number of parrots doubles every 22 years.

Assuming the population of monkeys grows exponentially, when will there be three times as many parrots as monkeys? Give your answer in years after 1930.

2. You have 900 meters of fencing to build an enclosure next to a long building, so fencing is not needed along the building side. The enclosure will have a partition (made of the same fencing material) perpendicular to the building, as illustrated below.



- (a) What should the dimensions (length and width) of the enclosure be to maximize the area of the enclosure?

- (b) What is the maximum possible area of the enclosure?

3. The more you study for the Math 120 final exam, the better your score will be, but you cannot exceed 100 percent. If you study for 4 hours, you will get a score of 45 percent. If you study for 16 hours, you will get a score of 75 percent.

Assume that the score you get on the final exam is a linear-to-linear rational function of the number of hours that you study.

How many hours do you need to study to get a score of 85 percent on the final exam?

4. (a) Find the fixed points of the function $f(x) = \frac{1}{2}x + \sqrt{x}$.

(b) Restrict the domain of $j(x) = 3x^2 - 12x + 7$ to $x \leq 2$ and find the function's inverse.

(c) Below is the graph of $y = g(x)$. Determine the x -intercepts of $h(x) = \frac{1}{2}g(2x + 5)$ (that is, the values of x such that $h(x) = 0$).

