

Math 120 A Autumn 2011
Mid-Term Exam Number One
October 20, 2011

Name: _____

Student ID no. : _____

Signature: _____

Section: _____

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. Maggie is moving in an xy -plane, with coordinates in meters. She moves at the constant speed of 6 meters per second. She starts at the point $(12, 3)$ and heads toward the y -axis along the line $y = \frac{1}{3}x - 1$.

(a) Give Maggie's parametric equations of motion.

(b) Give an expression for the distance from Maggie's location to the origin t second after she starts moving.

2. Jerry painted a bright yellow circle on Red Square. The circle had a radius of 25 feet. He then walked from a point 31 feet due south of the center of the circle directly to a point 8 feet north and 37 feet west of the center of the circle.

Jerry walked at a constant speed of 5 feet per second.

On Jerry's walk, how much time was he inside the circle?

3. Let $f(x)$ be a quadratic function. Suppose $f(1) = 2$, $f(5) = 10$, and $f(10) = 8$.

(a) Find $f(7)$.

(b) What is the smallest value of $f(x)$ on the interval $6 \leq x \leq 12$?

4. Let $g(x) = 3 + x + \left|1 - \frac{1}{2}x\right|$. Find all solutions to the equation

$$g(x) = \frac{x}{3}.$$