

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 8 meters per second. She starts at the point  $(15, 7)$  and heads toward the  $y$ -axis along the line  $y = \frac{2}{5}x + 1$ .

(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 18 feet. He then walked from a point 22 feet due east of the center of the circle directly to a point 12 feet south and 27 feet west of the center of the circle.

Jerry walked at a constant speed of 4 feet per second.

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

3. Let  $f(x)$  be a quadratic function. Suppose  $f(3) = 12$ ,  $f(4) = 5$ , and  $f(9) = 7$ .

(a) Find  $f(10)$ .

(b) What is the largest value of  $f(x)$  on the interval  $-1 \leq x \leq 8$ ?

4. Let  $g(x) = 5 + x - \left|2 - \frac{x}{3}\right|$ . Find all solutions to the equation

$$g(x) = \frac{3}{2}x.$$