

Math 120 A, B Autumn 2012  
Mid-Term Exam Number One  
October 18, 2012

Name: \_\_\_\_\_

Student ID no. : \_\_\_\_\_

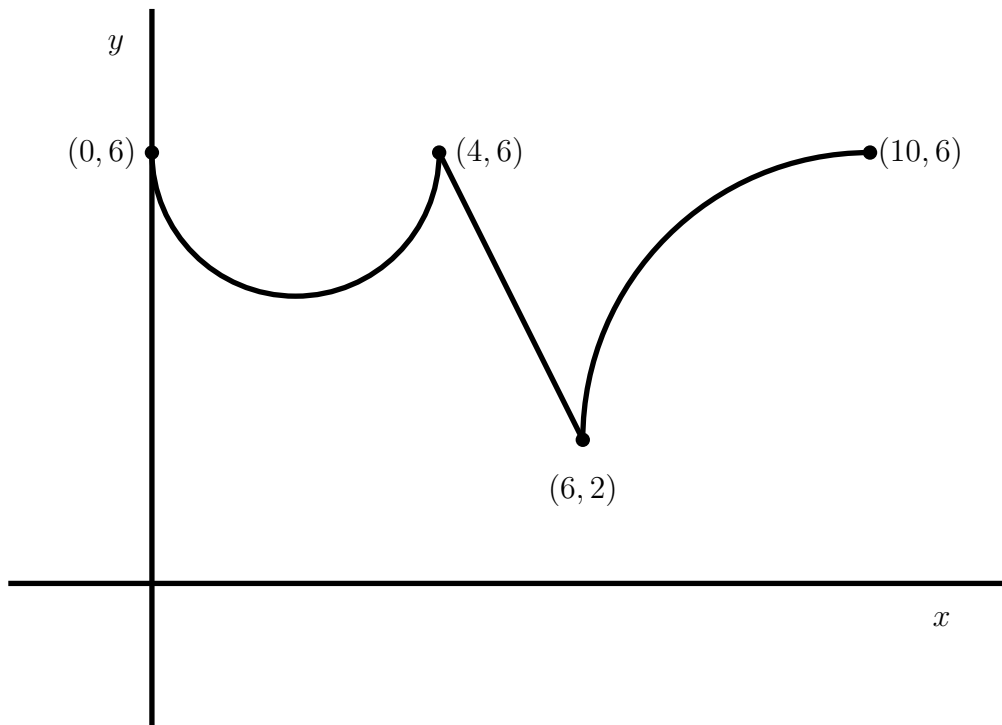
Signature: \_\_\_\_\_

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. Below is the graph of a multipart function,  $f(x)$ , which is composed of a straight line and two circular arcs. The function's domain is  $0 \leq x \leq 10$ .



Write the multipart rule for this function.

2. Titus and Ophelia are moving in the  $xy$ -plane. They both move along straight lines at constant speeds. The coordinates of the  $xy$ -plane are given in meters (e.g., the point  $(1, 0)$  is one meter to the right of the origin).

Titus leaves the origin and heads toward the point  $(5, 12)$  at a rate of 3 meters per second.

At the moment Titus leaves the origin, Ophelia starts moving from the point  $(5, -4)$  and heads toward the point  $(3, 2)$ . She will reach the  $x$ -axis after 2 seconds.

- (a) Give parametric equations for the location of Titus  $t$  seconds after he starts moving.

- (b) Give parametric equations for the location of Ophelia  $t$  seconds after she starts moving.

3. Renaldo is walking near the Circular Forest, a forest in the shape of a perfect circle with radius 9 km. Renaldo walks at a constant speed of 2 km/hr. Renaldo starts walking south from a point 5 km west and 1 km north of the northernmost point of the forest. After entering the forest, he continues walking for one hour, then turns and walks west until he leaves the forest.

For what length of time was Renaldo in the forest?

4. You are reading a book. Five days from now, you will have 200 page left to read. Ten days from now, you will have 150 pages left to read. Twenty days from now, you will have 125 pages left to read.

Suppose the number of pages you have left to read is a quadratic function of time.

When, in the next two weeks, will you have 175 pages left to read?

Give your answer in days from now (a non-whole number is okay!).