

Math 120 A - Winter 2006
Mid-Term Exam Number One
January 26, 2006

Name: _____

Section: _____

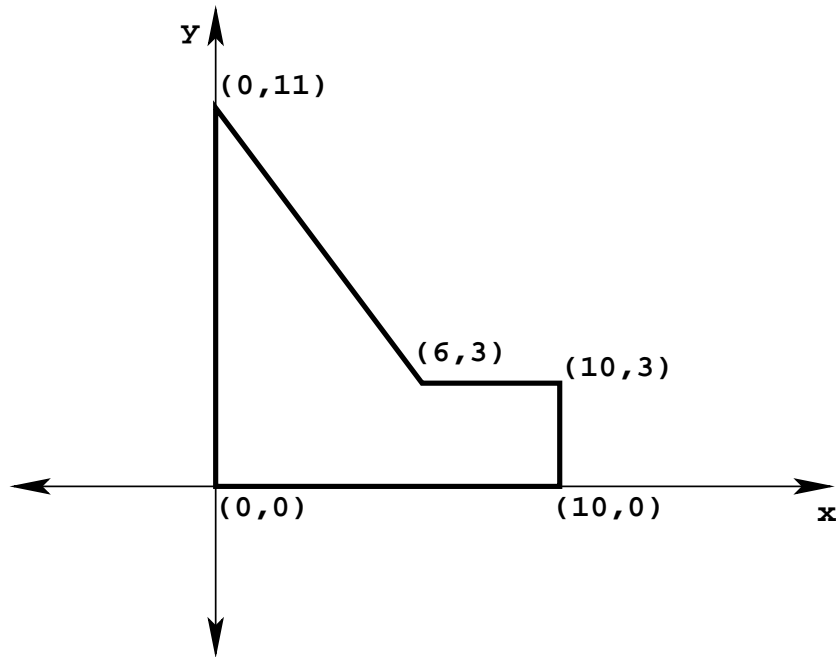
1	10	
2	10	
3	10	
4	10	
Total	40	

- Complete all questions.
- You may use a calculator during this examination. Other electronic devices are not allowed, and should be turned off for the duration of the exam.
- If you use a trial-and-error or guess-and-check method, or read a numerical solution from a graph on your calculator 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.
- Show all work for full credit.
- You have 50 minutes to complete the exam.

1. Susan is on a hike. She begins her trip from a point 2 km east of the southernmost point of a circular forest with a radius of 6 km. She heads directly toward the westernmost point of the forest. However, when she reaches a point due south of the center of the forest, she changes direction and heads west until she leaves the forest.

Impose a coordinate system with the center of the forest at the origin. What are the coordinates of the point where she leaves the forest?

2. Alice is going into business selling pizzas shaped like the polygon in the figure below. The coordinates indicate the vertices (corners) of the polygon pizza. The units are inches.



If a vertical cut is made in the pizza, x inches from the left edge of the pizza, determine the area of the pizza to the left of the cut as a multipart function of x .

3. The populations of the towns of Ribbit and Croak are each linear functions of time. In 1980, there were 40,000 people in Ribbit, and in 2000, there were 48,000 people in Ribbit. In 1990, Croak's population was one quarter the population of Ribbit, while in 1995 its population was one half that of Ribbit's.

When will the population of Croak be 10,000 more than the population of Ribbit?

4. Juliet is deciding how much to charge for the tickets to a concert. She knows from past experience that the amount of money she makes from the sale of the tickets will be a quadratic function of the ticket price. Obviously, if she charges nothing, she will make no money. If she charges \$1, she will make \$100. If she charges \$2, she will make \$180.

(a) How much should she charge to make the most money?

(b) What is the largest amount of money she could make?