

Math 120 A, B - Winter 2009  
Mid-Term Exam Number One  
January 29, 2009

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

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

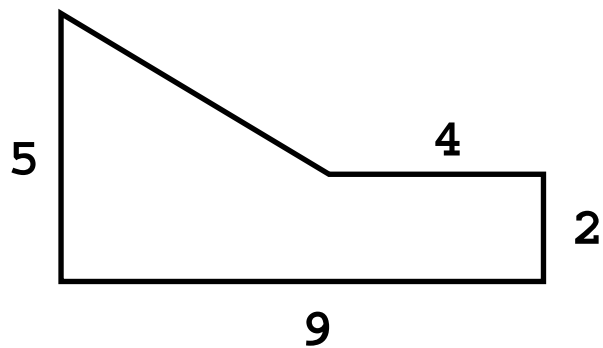
1	10	
2	10	
3	10	
4	10	
Total	40	

- Complete all four questions.
- You may use a scientific calculator during this examination. Graphic 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, 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. Write your name on your notesheet and turn it in with your exam.
- Show all work for full credit.
- You have 50 minutes to complete the exam.

1. Eric has been purchased a piece of land shaped as shown in the figure below. The dimensions in the figure are in miles.

Eric is considering dividing the land into two pieces using a vertical cut parallel to the left edge of the piece of land.

Suppose the cut is a distance of  $x$  miles from the left edge. Express the area of the region to the left of the cut as a multipart function of  $x$ .



2. You are producing a show. You are trying to determine the price you should charge per ticket. From past experience, you know that if you charge \$10 per ticket, you will sell 450 tickets. If you charge \$14 per ticket, you will sell 412 tickets.

Assume that the number of tickets sold is a linear function of the price per ticket.

- (a) Give the lowest ticket price at which you would make at least \$5000 from the sale of the tickets.

- (b) What is maximum possible amount you can make from the sale of the tickets?

3. Akiko is hiking near the Circular Forest, a forest in the shape of a perfect circle with a radius of 20 km. She begins walking from a point 7 km due north of the easternmost point of the forest. From there, she hikes due west for 12km. She then turns and hikes due north until leaving the forest.

If she hiked at a constant speed of 4 km/hr, how long (in hours) was Akiko in the forest?

4. Wen is walking from a point 100 feet west of a hibernating bear. He walks directly to a point 75 feet east and 80 feet north of the bear. How close does he come to the bear on his walk?