

Math 120 A - Spring 2007
Mid-Term Exam Number One
April 19, 2007

Name: _____

Section: _____

1	10	
2	10	
3	10	
4	10	
Total	40	

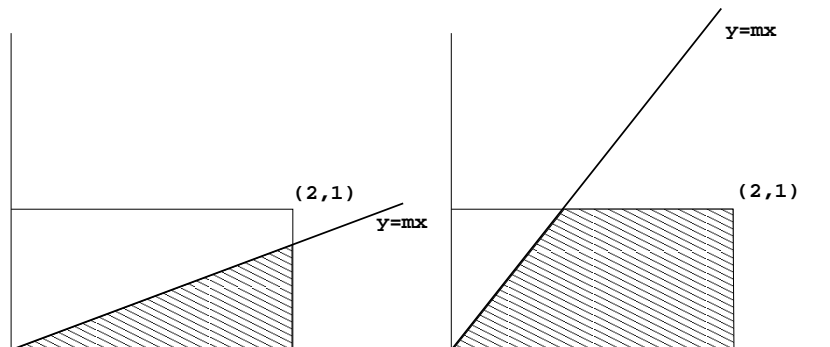
- Complete all questions.
- You may use a calculator during this examination. Other electronic devices are not allowed, and should be turned off for the duration of the exam.
- If you use a trial-and-error or guess-and-check method, or read a numerical solution from a graph on your calculator when an 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. Rose is selling tickets to her upcoming tuba performance. She knows from experience that the number of tickets she sells will be a linear function of the price that she sets for the tickets. If she sets the price at \$20, she will sell 150 tickets. If she sets the price at \$18.60, she will sell 162 tickets.

At what price will she make the most money?

2. Joey has a rectangular pizza that is 1 foot by 2 feet long. Joey wants to cut the pizza by making a straight slice through one corner of the pizza. With a coordinate system imposed as shown in the figures below, we can represent the slice by the line $y = mx$. Joey plans to eat the portion of the pizza below the slice (the shaded region in the figures below).

Two possible slices are shown here:



The area of the shaded region depends only on the **slope** of the slice.

- (a) Find the area of the shaded region when the slice has slope $m = 0.1$.
- (b) Find the area of the shaded region when the slice has slope $m = 1.3$.
- (c) Express the area of the shaded region as a multi-part function of the slope m .

3. Sally is walking in a straight line through the Circular Forest, which has the shape of a perfect circle. She enters the forest at a point 10 km east and 4 km north of the center of the forest. She exits the forest at Point P and continues walking in the same direction. Point P is due south of a point 3 km due east of the center of the forest.

When she is due south of the center of the forest, how far from the center is she?

4. Let $f(x) = 2x + 3$ and $g(x) = |x|$.

(a) Write the multipart rule for $g(f(x))$.

(b) Find all solutions to the equation

$$g(f(x)) = -3x + 9.$$