

Math 120 A - Winter 2008
Mid-Term Exam Number One
January 31, 2007

Name: _____

Section: _____

1	10	
2	10	
3	10	
4	10	
Total	40	

- Complete all four questions.
- You may use a calculator during this examination. 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.

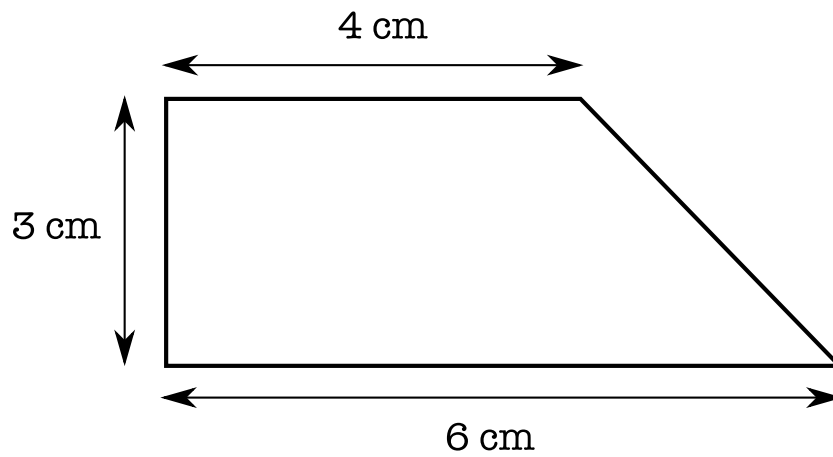
1. Gloria is selling tickets to her glockenspiel concert, and she is trying to decide what the ticket price should be. She knows from past experience that the number of tickets she will sell is a linear function of the ticket price. If the ticket price is \$2, she will sell 1000 tickets. If the ticket price is \$17.34, she will sell 200 tickets.

What should Gloria set the ticket price at for her to make the most money?

2. The Circular Forest has the shape of a circle with an 8 km radius. Wally starts walking due WEST from a point 12 km EAST and 3 km NORTH of the center of the forest. He walks for 6 km, then turns and walks due SOUTH and leaves the forest.

Wally walked at a constant speed of 4 km/hr. How much time did Wally spend in the forest?

3. A piece of paper has the shape and dimensions shown in the following figure.



Suppose the paper is cut with a vertical slice x cm from the left edge of the paper. Express the area of the paper to the left of the cut as a multipart function of x .

4. A number k is said to be a **fixed point** for a function $f(x)$ if

$$f(k) = k.$$

(a) Find all fixed points of the function $f(x) = \left| \frac{1}{2}x - 4 \right|$.

(b) Let $f(x) = 3x - 1$ and $g(x) = 5x + 8$. Find all fixed points of the function

$$h(x) = f(g(x)).$$