

Math 120 D - Autumn 2007
Mid-Term Exam Number One
October 18, 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.

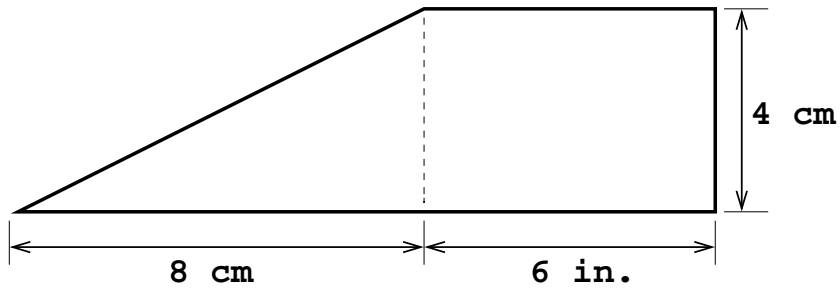
1. Robert starts walking due west from an oasis in the desert at noon. His walking speed is 4 km/hr.

At 2 PM, Maria starts walking north from a point 3 km due east of the oasis. She walks 5 km/hr.

When will Robert and Maria be 20 km apart? Give your answer in hours after noon.

2. Jean is walking along a railroad track that passes through a forest. The track is perfectly straight. In the forest, there is a spring. Jean starts walking on the track 5 km east and 2 km south of the spring. He heads along the track to a point 4 km west and 3 km north of the spring. During his walk, how close does he get to the spring?

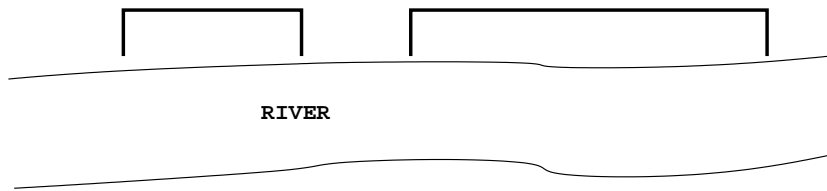
3. Trapezio Pizzeria sells pizza in the shape of a trapezoid as shown below.



Suppose you make a cut through the pizza, parallel to the right edge and x cm from the left endpoint.

Express the area of the pizza to the left of the cut as a multipart function of x .

4. Ophelia has 300 meters of fencing with which to make two enclosures next to a river. The enclosures will be rectangular, but she will use the river for one side of each enclosure, so no fencing is needed for that side. She wants the two enclosures to have the same width, and have one enclosure be twice as long as the other enclosure. An example of how she might do this is shown in the figure.



What should the dimensions of the smaller enclosure be to make the total combined area of the two enclosures as large as possible?