Math 120 A - Autumn 2014
Mid-Term Exam Number One
October 16, 2014

Name: _____   Student ID no. : _____

Signature: _____   Quiz Section (AA/AB/AC/AD): _____

1	10
2	10
3	10
4	10
Total	40

- Complete all four questions.

- Show all work for full credit.

- You may use a scientific calculator during this examination. Graphing 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 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.

- You have 50 minutes to complete the exam.

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1. The Circular Forest is a forest in the shape of a circle with a radius of 8 km. Maria takes a walk from a point 5 km EAST and 11 km SOUTH of the center of the forest. Maria walks in a straight line to a point 2 km WEST and 10 km NORTH of the center of the forest.

   (a) How far is Maria from her starting point when she leaves the forest?

   (b) How close does Maria come to the center of the forest?

2. For each of the following functions, simplify the expression
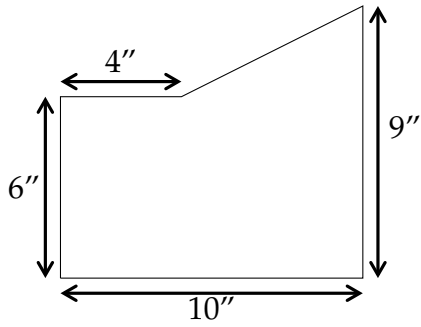
$$\frac{f(x+h) - f(x)}{h}$$

far enough so that plugging in $h = 0$ would be allowed.

(a) $f(x) = 9x + 3$

(b) $f(x) = 5x - 4x^2$

3. You have a pizza with the shape and dimensions as shown in the figure below.

Suppose you make a vertical cut x inches from the left-edge. Express the area to the left of the cut as a multipart function of x.

4. Aliyah and Zack start moving in the xy-plane at the same time. Aliyah starts from the point $(1, -3)$ and she moves directly toward the point $(6, 8)$, reaching $(6, 8)$ in 4 seconds.

   Zack starts from the point $(-2, 6)$ and moves directly toward the point $(10, -9)$. Zack crosses the x-axis at the same time that Aliyah does.

   All distance units are meters (so, for example, the point $(1, 0)$ is 1 meter from $(0, 0)$.)

   (a) Write parametric equations for Aliyah's position t seconds after she starts moving.

   (b) How fast does Zack move?