Math 120 A - Spring 2008
Mid-Term Exam Number Two
May 22, 2008

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. 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, 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. The height of Rita's favorite tree is a linear-to-linear rational function of time. Today, it is 8 feet tall. Five years from today, it will be 12 feet tall. Twenty years from today it will be 16 feet tall.

   When will the tree be 18 feet tall? Express your answer is years from today.

2. Sven is running clockwise around a circular track. Sven runs at 3.5 meters per second, and it takes him 82 seconds to complete a lap of the track. From his starting point, it takes him 14 seconds to reach the southernmost point of the track.

   After running for 20 minutes, how far (in a straight line) is Sven from the northmost point of the track?

3. The depth of the water in the bird bath in Louise’s yard is a sinusoidal function of time. At 3:00 AM today, the water was at its minimum depth, only 4 cm deep. The depth then increased, and will reach the maximum depth of 10 cm at 11:00 PM tonight.

   How deep will the water be at 5:00 PM today?

4. Let $f(x) = |2x - 4|$ and

$$g(x) = \begin{cases} x & \text{if } x < -1, \\ 2x + 1 & \text{if } -1 \leq x \leq 3, \\ 3 - x & \text{if } x > 3. \end{cases}$$

Write the multipart rule for the function $h(x) = f(x) + g(x)$.