

Math 120 A - Winter 2006
Mid-Term Exam Number Two
February 23, 2006

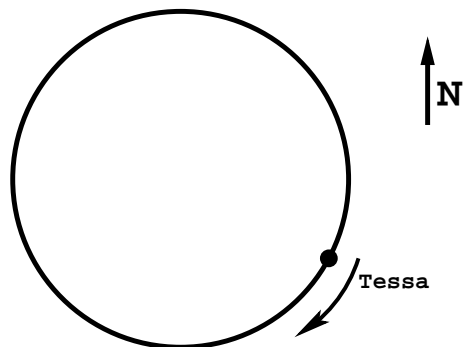
Name: _____

Section: _____

1	10	
2	15	
3	10	
4	10	
Total	45	

- 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. Tessa is running around a circular track. Her starting point and running direction are shown in the figure below.



It takes Tessa 70 seconds to reach the northernmost point of the track. She runs at 9 meters per second. It takes her 98 seconds to complete a lap of the track.

If she runs for 10 minutes, how far from the northernmost point (in a straight line) will she be when she stops?

2. Let $g(x) = |x - 2| + |x - 5|$.

(a) (10 points) Write the multipart rule for $g(x)$.

(b) (5 points) Is $g(x)$ a one-to-one function? Explain.

3. The IQ of Gradually Smarter Guy is a linear-to-linear rational function of time. Today, his IQ is 102. Ten days from now, his IQ will be 110. His IQ will gradually approach but never exceed 200.

When will his IQ be 160?

4. Yuri is shrinking (i.e., his height is decreasing). While he shrinks, he stares at a spot on a nearby wall that is 12 feet above the floor. Initially, the angle θ of view to the spot is 35 degrees. He then shrinks one foot in height, and the angle is 39 degrees. How tall is Yuri then? Give the height of his eye above the floor.

