Problems for the televised review for 135, S2009.

Note:

The exam problems may be different from those problems.

You will benefit the most by trying to solve all the problems before the broadcast.

Due to time limitation of 90 minutes, those problems don't cover all the material in 135.

You should also watch last term (F2008) power point televised session, available online at http://rutv.rutgers.edu/tutorials_archive.shtml.

1. Find the absolute max/min of the function $e^{-x}\sin x$ on the interval $[0, 2\pi]$

2. Sketch the graph of the function $g(x) = x\ln x$. Label on your graph all local max./min. and inflection points.

3. A manufacturer needs to produce a cylindrical closed can to hold 500 cubic cm of liquid. Find the dimensions of the can that minimizes the cost.

4. Evaluate $\lim\limits_{x\to\infty}(1+\dfrac{1}{3x})^x$.

5. Evaluate $\lim\limits_{x\to 2}\dfrac{x|x-2|}{x-2}$.

6. An observer, 500 feet from an hot air balloon is looking as it is rising from the ground. He notices that the angle of elevation is increasing at the rate of $0.14 rad/min$. How fast is the balloon rising when the angle of elevation is $\pi/4$?

7. Find the equation of the tangent line to the curve $e^{xy} + x = 2y^2$ at $(0, 1/2)$.

8. Find the possible values of $f(3)$ given all these facts:

(a) $f(x)$ is a continuous and differentiable function on $[-2, 3]$.

(b) $f(-2) = 4$

(c) $1 < f(x) < 5$

9. Approximate the area under the parabola $y = x^2$ on the interval $[0, 12]$ using Riemann sums with n=6 and the representative points to be the midpoints of each subinterval.

10. Show that $\int \tan x dx = \ln|\sec x| + C$.

11. Find the area under the curve $y = xe^{x^2}$ between $x = 0$ and $x = 5$.