You have 60 minutes to complete this test. You must show all work to receive full credit. Work any 6 of the following 7 problems. Clearly Cross Out the problem you do not wish me to grade. Each problem is worth 16 points, and you get 4 points for free, for a total of 100 points. The answers will be posted on the electronic reserves later today.

1. Solve \( \frac{dy}{dx} = \frac{1}{y^2(2x-5)^6} \) if \( y = 0 \) when \( x = 2 \).

2. Find \( f'(x) \) for the following functions. DO NOT simplify!

(a) \( f(x) = x^2 \ln(3x) \)

(b) \( f(x) = \sqrt{e^{x^2-6}} + 4x \)
3. Suppose you want to have $15,000 three years from now in order to purchase a car. How much will you need to invest in one lump sum now at an annual rate of 6% compounded monthly in order to reach your goal?

4. Suppose that the number of hamburgers sold by a national fast-food chain grows exponentially. If 4 billion were sold by 2005 and 12 billion had been sold by 2010, in what year will sales reach the 25 billion mark?
5.  
   a) If \( \log_3 x = 2 \log_3 6 - \log_3 7 \), find \( x \). Your solution should be a rational number.
   
   b) If \( \log_3 x = 6 \), \( \log_3 y = \frac{1}{2} \), and \( \log_3 z = 3 \), calculate \( \log_3 \frac{\sqrt{x}}{y^2 z} \).

6.  
   Evaluate the following integrals:
   
   a) \( \int 5e^{3x} \, dx \)
   
   b) \( \int \frac{3x - \sqrt{x}}{x^2} \, dx \)
   
   c) \( \int 2xe^x \, dx \)
7. Find all maxima, minima and inflection points of $f(x) = xe^x$. (If there are none, say so.) Also give the intervals where $f$ is increasing, decreasing, concave up, and concave down. Find all asymptotes (or say there are none). Then carefully sketch the graph of $f$. Be sure to label the asymptotes, extrema, and inflection points.
Monthly, Semi-Monthly

Missing Items Lists – Send to Kellie in cat – currently file 303

Other Lists to generate?

Mobius Reports

  Cull and act on information – either file xcel workbooks in month folders or add sheet
  for each month to current year workbook

Counts report – Web Management – see Circ Notes for process

  http://merlin.mobius.umsystem.edu:6060/iii/webrpt/Splash.html

Billing – moving current month to Awaiting 30 days – verify if paid/returned, etc..

  Block awaiting 30 days that are not clear – change MBlock and JoeSS record

  File blocked students in drawer

Patron Accounts filed in Yellow folder

Weekly

Mobius Paged too long report

Cash drawer – Friday, Saturday and covering

Morning Notices and Morning Mail – same

Supervisor Desk Tuesday -12-3, Thursday 12-3, and Friday 10-12

Tally-Door Counts, Use Counts

High Demand Holds?

Daily

Verify new Patron accounts Sheet data items, add to pile, or file problem sheets in plastic folder

Billing notices – survey issue, status of patron, clarify $min for paperback/hardback, waive as appropriate, attach check off list for billing, file in current month

Have Student perform daily search for missing items {Weekly?}

TimeSheet Recording

As Needed
Check task list for pending activities

Initiate Searches for NOS items -

To Do

Decisions on email folders organization