

## PRACTICE EXAM II

MAT 122 · FALL 2008

You must show all work to get full credit.

**Problem 1.** Solve each equation for the unknown variable.

- a.  $\log_4 x = 2$
- b.  $\log_b 125 = 3$
- c.  $\log_4 256 = y$ .
- d.  $25 + 3 \ln x = 10$ .

**Problem 2.** Rewrite the following as the logarithm of a single quantity

- a.  $3 \log_3(x + 3) + 2 \log_3 z$
- b.  $2 \log x + 3 \log y - \frac{1}{2} \log z$
- c.  $\frac{1}{3} \log_3 x - \frac{2}{3} \log_3 y - \frac{4}{3} \log_3 z$
- d.  $\log_5 x + \frac{1}{2} \log_5(x^2 + 4)$

**Problem 3.** Let  $f(x) = \log_3 x$ .

- a. Sketch a graph  $f$
- b. Determine the  $x$ -intercept
- c. What is the domain of  $f$ ?
- d. What is the range of  $f$ ?
- e. Does the graph have a vertical or horizontal asymptote?
- f. If  $f(x) = 5$ , what is  $x$ ?

**Problem 4.** One type of uranium decays at a rate of 0.35% per day. If 40 pounds of this uranium is available today, how much will be available after 90 days?

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