

COLLEGE ALGEBRA - MAT 140

FALL 2008 - EXAM 5(v2)

Name : _____

TO RECEIVE FULL CREDIT YOU MUST SHOW YOUR WORK. No notes or books are allowed.

No. 1. (6 points) State whether each statement is **True** or **False** as stated. Provide a clear reason for your answer.

i) $\log_2 16 = \frac{\ln 16}{\ln 2}$

ii) $\log_2(3x^4) = 4\log_2(3x)$

iii) $\ln(x+3) - \ln(2x) = \frac{\ln(x+3)}{\ln(2x)}$

No. 2. (6 points) Write the given expression as a sum and/or difference of logarithms. Express powers as factors.

$$\log_5 \left(\frac{\sqrt[3]{x^2+1}}{x^2-1} \right), \quad x > 1$$

No. 3. (20 points) Suppose that $\ln 2 = b$ and $\ln 3 = a$. Find

a) $\ln 6$

b) $\ln \frac{2}{3}$

c) $\ln 1.5$

d) $\ln 0.5$

e) $\ln \sqrt[4]{\frac{2}{3}}$

No. 4. (6 Points) Write the given expression as a single logarithm.

$$3 \log_5(3x + 1) - 2 \log_5(2x - 1) - \log_5 x$$

No. 5. (24 Points) A credit union pays interest of 6% per annum on a certain savings plan. If \$1,000 is deposited in such a plan and the interest is left to accumulate, what is amount in the account after 3 years if the interest is compounded

i) Annually?

ii) Semiannually?

iii) Every four months?

iv) Quarterly?

v) Monthly?

vi) Daily?

No. 6. (6 points) How long will it take for an investment to double in value if it earns 4% compounded continuously?

No. 7. (12 points) Assume that you have an initial investment of \$25,000 which you deposit in an account that pays an interest rate of 7% compounded continuously.

a) What is the amount in the account after 6 years?

b) How many years will it take the investment to grow to \$80,000?

No. 8. (20 points) Solve the equations (Round your solutions to two decimal places.)

i) $\log_5(2x + 3) = \log_5 3$

ii) $2\log_3(x + 4) - \log_3 9 = 2$

iii) $5(2^{3x}) = 8$

iv) $0.3^{1+x} = 1.7^{2x-1}$