

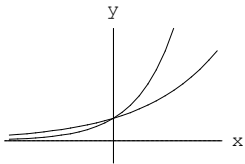
MS 101 Spr 11 Sample Test 1 (5.1-5.5)

Formulas: $A = P(1 + \frac{r}{n})^{nt}$ $A = P e^{rt}$ $\log_a(x) = y$ is equivalent to $a^y = x$ for $0 < a \neq 1$ and $x > 0$

01. (06 pts) Use a calculator(round to three decimals):

- Evaluate the function $f(x) = 3.2^x$ for $x = 4$.
- Evaluate the function $f(x) = 2(3.2^x)$ for $x = 3$.
- Evaluate the function $f(x) = 2(3.2^{3^x})$ for $x = 2$.
- Evaluate the function $f(x) = \log(x)$ for $x = 2$.
- Evaluate the function $f(x) = \ln(x)$ for $x = 2$.
- Evaluate the function $f(x) = \log_5(x)$ for $x = 2$.

02. (04 pts) One of the graphs below is $y = 2^x$ and the other is $y = 5^x$. Label each one.



03. (04 pts) Suppose \$250 is invested at 7% APR for 5 years.

- Find the value of the account if it is compounded monthly. $A = \underline{\hspace{2cm}}$
- Find the value of the account if it is compounded continuously. $A = \underline{\hspace{2cm}}$

04. (02 pts each) Write each of the following exponential equations as a logarithmic equation.

- $2^3 = 8$
- $4^2 = 16$
- $e^{-.0446x} = 12$

05. (02 pts each) Write each of the following logarithmic equations as an exponential equation.

a) $\log_5(25) = 2$

b) $-5 = \log_2\left(\frac{1}{32}\right)$

c) $\log(5x) = 0.1234$

06. (04 pts) The expression $\log\left(\frac{x^2}{y}\right)$ is equivalent to which one of the following expressions:

a) $\frac{2\log(x)}{\log(y)}$

b) $\frac{\log(x^2)}{y}$

c) $\log(x) + \log(x) - \log(y)$

d) $\log(2x) - \log(y)$

07. (04 pts) The expression $\log(5) - \log(y) + \log(z)$ is equivalent to which one of the following expressions:

a) $\log\left(\frac{5}{y}z\right)$

b) $\log\left(\frac{5-y}{z}\right)$

c) $\log\left(\frac{5}{y} + z\right)$

d) $\log(5 - y + z)$

08. (04 pts each) Find the algebraic solution, then use your calculator to find a decimal approximation to 3 decimals.

a) $3 \ln(2x) = 9$ $x = \underline{\hspace{2cm}}$

b) $5 + 2 \ln(x) = 15$ $x = \underline{\hspace{2cm}}$

c) $e^{3x} = 9$ $x = \underline{\hspace{2cm}}$

d) $4e^{2x} = 12$ $x = \underline{\hspace{2cm}}$

09. (04 pts) A jar containing maggots has 450 maggots on Wednesday and two days later, on Friday it contains 600 maggots. Assuming that the population is growing exponentially, find the model $N = ae^{bt}$ where N is the number of maggots and Monday is Day 0 (that is, $t = 0$ corresponds to Monday). Round b to 4 decimals and a to two decimals.