

Exam 3 Review

Math 1090-008

Topics to Study

Chapter 4: Exponential and Logarithmic Functions

- know how to graph both exponential and log functions
- know how to express exponentials as logs and vice versa
- know how to manipulate an exponential or log (ie. properties of logs)
- know how to solve both exponential and log functions
- know how to do problems with radioactive decay (find half-life)

Chapter 5: Finance

- NOTE: some equations will be given, BUT you need to know how to use them
- Know how to find:
 - geometric sequence, sum of geometric series
 - compound amount, compound interest
 - nominal interest rate, effective interest rate
 - time for \$ to grow, time periods to pay off debts
 - equations of value
 - Present Value(including NPV, PV of annuity, PV of annuity due)
 - Future Value (including FV of annuity, FV of annuity due)
 - annuity amount
 - sinking funds
 - amortization schedules
 - * periodic pymts
 - * principal outstanding at beginning of kth period
 - * interest in kth payment
 - * finance charge
 - * principal contained in kth payment

Chapter 6: ONLY SECTIONS 6.1, 6.2

- Matrices: know how to
 - construct one, determine size
 - determine equality
 - take the transpose
 - find diagonal
 - determine upper/lower triangular
 - add, subtract, multiply by scalar

How to Study

- REDO and make sure to understand ALL HOMEWORK problems (from homeworks 7, 8 and 9)
- DO the optional problems given on the homeworks
- REDO all the examples given in class
- DO the following review

Equations Provided

$$s = \frac{a(1 - r^n)}{1 - r}$$

$$S = P(1 + r)^n$$

$$r_e = \left(1 + \frac{r}{n}\right)^n - 1$$

$$A = R \left(\frac{1 - (1 + r)^{-n}}{r} \right) = Ra_{\overline{n}|r}$$

$$S = R \left(\frac{(1 + r)^n - 1}{r} \right) = Rs_{\overline{n}|r}$$

$$\text{Principal at beginning of } k\text{th period} = Ra_{\overline{n-k+1}|r}$$

$$\text{Interest in } k\text{th payment} = Rra_{\overline{n-k+1}|r}$$

$$\text{Principal in } k\text{th payment} = R[1 - ra_{\overline{n-k+1}|r}]$$

$$\text{Total Interest} = R(n - a_{\overline{n}|r})$$

Other Review Problems - DON'T ONLY study these!!

1. Without using a calculator, find the value of $\log_{\frac{1}{3}} 9$.
2. Without using a calculator, find x in $\ln(2x + 3) = 0$.
3. Find x for $\log(x) + \log(10x) = 3$
4. Sketch the graph of $y = -2\log_2(x)$
5. Write $\log_3(x + 5)$ in terms of natural logarithms.
6. An investor has a choice of investing a sum of money at either 8.5% compounded annually or 8.2% compounded semiannually. Which is the better choice?
7. For an annuity of \$200 at the end of every six months for $6\frac{1}{2}$ years, find (a) the present value and (b) the future value at an interest rate of 8% compounded semiannually.

8. Construct an amortization schedule for a loan of \$15,000 repaid by five monthly payments with interest at 9% compounded monthly.

9. Simplify

$$2 \begin{bmatrix} 3 & 4 \\ -5 & 1 \end{bmatrix} - 3 \begin{bmatrix} 1 & 0 \\ 2 & 4 \end{bmatrix}$$

10. Compute A^T for

$$\begin{bmatrix} 1 & 0 & 9 & 4 \\ -1 & 0 & 7 & 6 \\ -3 & -2 & 0 & 3 \\ 1 & -1 & 2 & -2 \end{bmatrix}$$

11. Solve the matrix equation:

$$3 \begin{bmatrix} x \\ y \end{bmatrix} - 3 \begin{bmatrix} -2 \\ 4 \end{bmatrix} = 4 \begin{bmatrix} 6 \\ -2 \end{bmatrix}$$