

Math 1030-6 Midterm Exam 2
04/15/2009

Write only with black or blue pen. Answers written in pencil will not be considered.
Read the exercises carefully. Show your work and circle your answers.

Exercise 1 (7pt):

A bank offers an APR of 3.5% compounded daily.

What is the coefficient of the increasing after 5 years?

Exercise 2 (7pt):

How long will it take your money to triple at an APR of 8% compounded annually? And if is continuous compounded?

Exercise 3 (7pt):

Find your saving plan balance after 15 months with an APR of 7% and weekly payments of \$200.

Find the balance for the first two weeks step by step.

(use the formula $A = PMT \frac{1 - (APR/n)^{nY}}{APR/n}$)

Exercise 4 (10pt):

You need a loan of \$70,000 to buy a boat to travel from the U.S. to Italy. Calculate the total costs in the two cases:

- 15-years fixed rate at 6.5% with closing costs of \$500 and no points.
- 20-years fixed rate at 5.5% with closing costs of \$1,000 and 3 points.

$$(PMT = [P(APR/n)] / [1 - (1 + APR/n)^{-nY}])$$

Exercise 5 (8pt):

Inflation is causing prices to rise at a rate of 12% per year. For an item that costs \$500 today, what will the price be in 4 years? (Use both the approximate formula and the real one) How much is the doubling time?

Exercise 6 (8pt):

Radium-226 is a metal with a half-life of 1600 years. If you start with 2 kilograms, how much will remain after 2500 years? What is the rate of decay?

Exercise 7 (7pt):

A population start growing exponentially with a base rate of 6% per year. If the C.C. (carrying capacity) is 97 million, find the actual growth rate when the population is 16 million and 27 million.

Exercise 8 (7pt): The following statistic data shows the growth of the population of Masaki's viruses:

Day	Viruses
1	30
3	51
7	147.39
9	250.56

Does this data follow any kind of model?

Exercise 9 (8pt): A group of climbers begin climbing at an elevation of 6500 feet and ascend at a steady rate of 600 vertical feet per hour. What is their elevation after 3.5 hours?

To solve the problem create the linear function representing the situation (sketch the graph).

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