

Math 132 - Spring 2002
Sections 2 and 4

EXAM 2

For this exam you may use a calculator and a 3 by 5 note card. No other books or notes are allowed. Questions are worth 10 points each except for the MULTIPLE CHOICE (5 points each.) 100 total points possible.

1 - 3. MULTIPLE CHOICE. CHOOSE THE BEST ANSWER.

1. The following sequence lists the number of times a cricket chirps during evenly spaced time intervals at increasing temperatures. 9, 16, 23, 30, 37, 44, 51, 58, 65
What kind of a sequence is this?
 - a) exponential
 - b) Fibonacci
 - c) arithmetic
 - d) logistic
 - e) geometric

2. Suppose you need a way to go from one term of a sequence to the next term. Which one of the following will help?
 - a) Fibonacci sequence
 - b) recursive definition
 - c) Sierpinski gasket
 - d) Koch snowflake
 - e) explicit formula

3. Which one of the following statements is true regarding the Koch snowflake?
 - a) The boundary is infinite and the area is finite
 - b) The boundary is finite and the area is infinite
 - c) Both the boundary and the area are finite
 - d) Both the boundary and the area are infinite

4. (5 points) The following is the beginning of a geometric sequence: 3, -6, 12, ...
Find the 10th term.

5. Suppose Mary Lou starts saving money by putting 1 cent aside on the 1st day of the month, 2 cents on the 2nd day, 4 cents on the 3rd day, doubling the amount saved from day-to-day. What amount has been saved at the end of 20 days?

6. Consider the Fibonacci Sequence defined by $F_1 = 1$, $F_2 = 1$, $F_N = F_{N-1} + F_{N-2}$ for $N > 2$. Show how to use the facts that $F_{23} = 28,657$ and $F_{25} = 75,025$ to find F_{26} .

7. If you borrow \$6,000 at 8% annual interest compounded quarterly, and make no payments, what do you owe at the end of 5 years? It is O.K. to just write an expression for your answer.

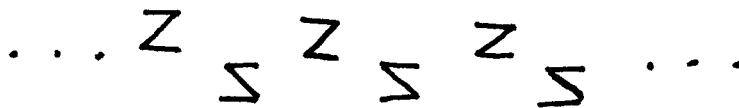
8. Recall that the Koch Snowflake starts with an equilateral triangle. At step 1 there are 12 edges.

a) How many edges are there at step 2?

b) Suppose in the original triangle each edge has length 12. What is the perimeter of the snowflake at step 2?

9. Suppose that in a population growing according to the logistic growth model we have $p_5 = 0.7$ and $p_6 = 0.315$. What is the growth rate r ?

10. List all the symmetries of the following border pattern.



11. Make a comparison of the growth of the following two sequences by the end of the 6th transition period.

a) Arithmetic, $P_0 = 1000$, $d = 50$

b) Geometric, $P_0 = 2$, $r = 3$

12. Consider the Mandelbrot replacement process defined by the following:

Start with s .

If x is the number obtained in the previous step, replace x with $x^2 + s$.

Suppose that at step 6 we have $x = 4$
and at step 7 we have $x = 7$

What does x equal at step 8?

End of exam