Senior 4 Applied Mathematics (40S)
Standards Test

Inquiry Task

June 2005

Manitoba
Building for the Future

SENIOR 4 APPLIED MATHEMATICS (40S)
STANDARDS TEST

DESCRIPTION

Total Possible Marks: 18 **Time: 2 hours**

This test consists of two tasks:

	Description	Suggested Time to Complete	Marks
Task 1	Contains a question on Design and Measurement worth 8 marks	60 minutes	8
Task 2	Contains a question on Sequences worth 10 marks	60 minutes	10

TEST RESOURCES AND DIRECTIONS

- This test should be written with the assistance of computer software and/or a graphing calculator.
- You may consult your 8½" × 11" individually prepared study sheet during the test.
- If you use a graphing calculator, make sure you indicate all the values you entered in the space provided in this booklet.
- If you use a spreadsheet, make sure you print two copies of your spreadsheets, one showing the answers and one showing the formulas. Indicate your booklet ID number on each printout. Remain seated and your teacher will distribute these printouts to you.
- If you use a Website, make sure you indicate all the values you entered, and print or copy the screen, showing answers.
- Please staple printed copies of all your work on the page of the question. Indicate in the response space of the question that the answer is on a printed sheet.
- Clearly identify the question number on your answer sheet(s) (e.g., Question 2b).
- Always state your assumptions.

DO NOT USE

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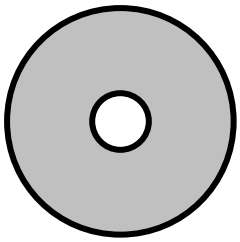
DESIGN AND MEASUREMENT

1. Linda has prepared two cakes. One is in a rectangular pan that measures 9 inches by 13 inches, with a depth of 3 inches. The other is in a circular tube pan which is 12 inches in diameter and 5.50 inches deep. The circular pan which has a cylinder in the centre produces a round cake with a 3-inch diameter hole in the centre.

Total: 8 marks



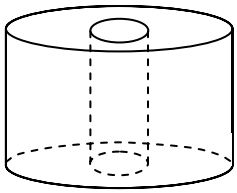
a) Linda wants to use the rectangular cake for a birthday party. She needs to cut 5 large pieces (4" × 3") and at least 12 small pieces (2" × 2") for her guests (whole pieces only). Does she have enough cake for her guests? Support your answer with a scale drawing.

(2 marks)

DO NOT USE

b) Linda wants to calculate the cost of making and decorating the circular cake. She will put a uniform layer of icing on the outside and inside walls, and the top of the cake. For decoration, a chocolate string will go on the top circumference of her cake, including enough to go around the centre opening. Calculate the total cost to make and decorate Linda's cake. Show your work.

Batter	\$0.004 per $in.^3$
Icing	\$0.01 per $in.^2$ (uniform layer)
Chocolate string	\$0.39 per ft. (sold in one foot lengths)



(6 marks)

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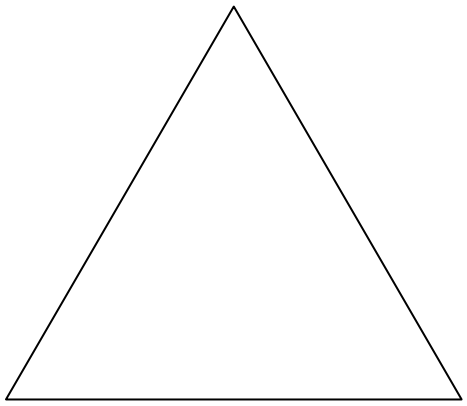
SEQUENCES

2. Create a fractal using the outside of the equilateral triangle below. Your fractal must always be created on the outside of the previous iteration.

Total: 10 marks

a) Draw your fractal to the 3rd iteration (inclusive) on the original shown below. *(2 marks)*



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b) Write specific directions to draw your fractal pattern.

(2 marks)

c) Complete the table for the first 4 iterations of your fractal. Assume that the original triangle has sides of length 6 cm.

(3 marks)

	Number of sides	**Length of each side**	**Total Perimeter**
original triangle	3	6 cm	18 cm

Iteration	**Number of new sides**	**Length of each new side**	**Total Perimeter**
1			
2			
3			
4			

DO NOT USE

d) What would the total perimeter of your fractal be after 6 iterations?

(1 mark)

e) What would happen to the perimeter of the fractal if the number of iterations increased indefinitely? Support your answer.

(2 marks)

END OF TEST

NO MARKS WILL BE AWARDED FOR WORK DONE ON THIS PAGE.

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