

USING THE GRAPHING CALCULATOR  
TO SOLVE PROBLEMS INVOLVING  
**SEQUENCES**

TOGETHER:

1) A sequence is defined by the formula:  $u(n) = \frac{n^2 + 16n + 39}{n^2 + 4n + 3}$ . That is  $u(1) = 7$ ,  $u(2) = 5$ ,  $u(3) = 4$ ,  $u(4) = 3.4$  etc... How many terms of this sequence are integers? How many terms of this sequence are greater than 1.5?

2) Find the sum of the squares of the first 50 positive integers.

3) Calculate the sum  $1 + (4/5) + (4/5)^2 + \dots + (4/5)^{50}$

4) The Fibonacci sequence is defined as follows. The first term is  $u(1) = 1$ , the second term  $u(2) = 1$ . Each other term in the sequence is defined as the sum of the previous two terms,  $u(n) = u(n-1) + u(n-2)$ . For instance:  $u(3) = 2$ ,  $u(4) = 3$ ,  $u(5) = 5$ ,  $u(6) = 8$  etc... Find the fiftieth term of this sequence.

HOMEWORK:

1) A sequence is defined by the formula:  $u(n) = \frac{n^2 + 9n + 8}{n^2 + 3n + 2}$ . How many terms of this sequence are integers? How many terms of this sequence are greater than 1.1?

2) Find the sum of the cubes of the first 50 positive integers.

3) Calculate the sum  $1 + (5/4) + (5/4)^2 + \dots + (5/4)^{50}$

4) The first term in a sequence of numbers is  $u(1)=5$ . Succeeding terms are defined by the statement  $u(n) = u(n-1) + 2n+3$  for  $n \geq 2$ . For instance,  $u(2) = 5 + 4+3 = 12$ ;  $u(3) = 12 + 6+3 = 21$  Find  $u(50)$ .

5) A sequence is recursively in the following way. The first two terms are  $u(1) = 1$  and  $u(2)=2$ . Each other term is the difference of the previous two terms:  $u(n) = u(n-1) - u(n-2)$ . Write the first 10 terms of the sequence. What is  $u(100)$  ? Calculate the sum of the first 100 terms of the sequence.

Answers homework: 1) 2 integers, 57 terms                      2) 1625625    3) 280256  
4) 2700                      5) -1; 3