Course Review

Chapter 11 - Sequences and Series

11-1 Sequences and Series

Sequence: A function whose domain is the set of positive integers (1, 2, 3, …) called "terms" and the listing of output values that follow some function rule.

EXAMPLE: $a_n = 3(n-2)$; terms: 1, 2, 3; sequence: -3, 0 3;

- finite sequence: domain is finite
- infinite sequence: domain is infinite

Sequence/Calculator: 1) Set [MODE] to SEQ

2) [Y=] and enter formula (use the [X,T,Θ,n] button for variables)

3) [2nd] + [GRAPH] to view (ie, "TABLE" command)

Recursive Formulas: Sequences defined by the first term and the n^{th} term.

EXAMPLE: $S_1 = 1$, $S_n = 4 \bullet S_{n-1}$

Recursive/Calculator: 1) Set [MODE] to SEQ

2) [Y=] and enter formula

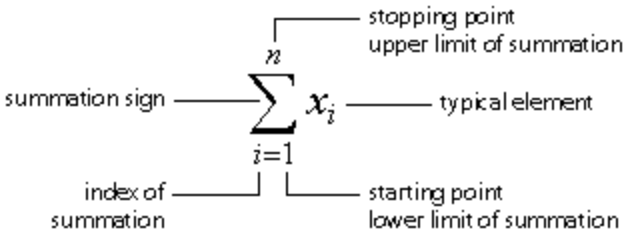
(use the [X,T,Θ,n] button for "n")

(use the "u" [2nd]+[7] for S)

3) Enter 1st term below "u" (nMin)

4) [2nd] + [GRAPH] to view (ie, "TABLE" command)

Summation Notation: Finds the sum of the first "n" terms of a sequence ($a_1 + a_2 + a_3 + \ldots + a_n$)



Summation/Calculator: 1) [2nd] + [STAT] → MATH → 5:Sum(

2) [2nd] + [STAT] → OPS → 5:Seq(

3) Expr: 6X+8

Variable: X

Start: 1

End: 10

Step: 1

Paste: → [ENTER] + [ENTER]

11-2 Arithmetic Sequences *(on formula chart)*

Explicit: $\mathbf{a_n = a_1 = d(n-1)}$

a_1 = first term
d = common difference (any number minus the number before it)
n = index (integer location of number in the sequence)

Recursive: $\mathbf{a_1}$ **= [some number];** $\mathbf{a_n = a_{n-1} + d}$

Arithmetic Series: The sum of an arithmetic sequence

$$\mathbf{Sn = \frac{n}{2}(a_1 + a_n)}$$

11-3 Geometric Sequences and Series *(on formula chart)*

Explicit: $\mathbf{a_n = a_1 \bullet r^{n-1}}$

a_1 = first term
r = common ratio (any number divided by the number before it)
n = index (integer location of number in the sequence)

Recursive: $\mathbf{a_1}$ **= [some number];** $\mathbf{a_n = a_{n-1} \bullet r}$

Finite Geometric Series: The sum of a finite geometric sequence

$$\mathbf{Sn = a_1 \bullet \left(\frac{1 - r^n}{1 - r}\right)} \qquad \mathbf{where\ |r| > 1}$$

Infinite Geometric Series: The sum of an infinite geometric sequence

$$\mathbf{Sn = \frac{a_1}{1 - r}} \qquad \mathbf{where\ |r| < 1}$$