

## Graphing Sequences and Partial Sums of Series

We'll consider the sequence  $\{ .9^n \}$  and the partial sums of the corresponding infinite

series  $\sum_{k=1}^{\infty} (.9^k)$ .

Step 1 Define the sequence

$$f(n) := .9^n$$

Step 2 Define the nth partial Sum:

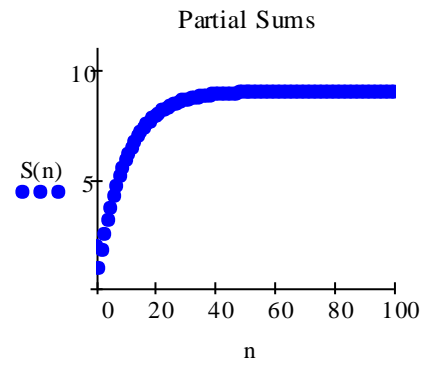
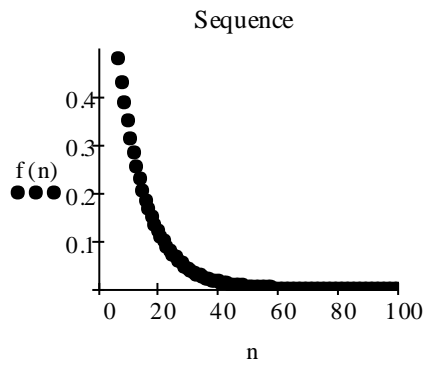
$$S(n) := \sum_{k=1}^n .9^k$$

Define the number of points we'll use 100

$n := 0..100$  - later we'll change 100 to FRAME. For all sequences we use a step size of 1 so we just use  $n := \text{first point}..\text{last point}$  using the  $m..n$  symbol on the matrix menu.

Here we'll use 2 separate graphs

1. For both under Plot change from lines to points
2. Add a symbol
3. In the Format Menu under label add Titles



To animate we then have:

`n := 1..FRAME`

`N := FRAME+ 1` We define N to show the Nth term of the sequence and the Nth Partial Sum

`f(n) := .9n`

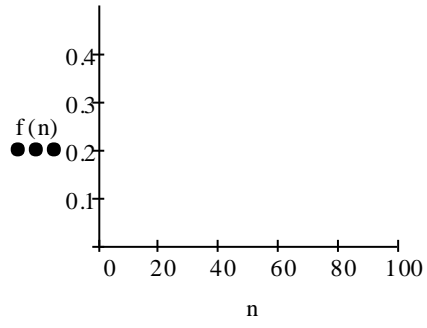
`S(n) :=  $\sum_{k=1}^n (.9)^k$`

$$N = 1$$

$$f(N) = 0.9$$

$$S(N) = 0.9$$

Sequence



Partial Sums

