Graphing Sequences and Partial Sums of Series

We'll consider the sequence { $.9^n$ } and the partial sums of the corresponding infinite series $\sum_{k=1}^{\infty} \left(.9^k\right)$.

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

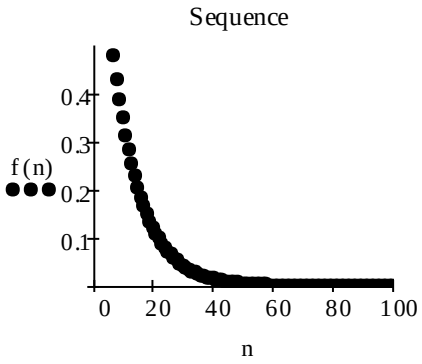
$n := 0..100$ - later we'll change 100 to FRAME. For all sequences we use a step size of 1 so we just use n := first point..last point using the m..n symbol on the matrix menu.

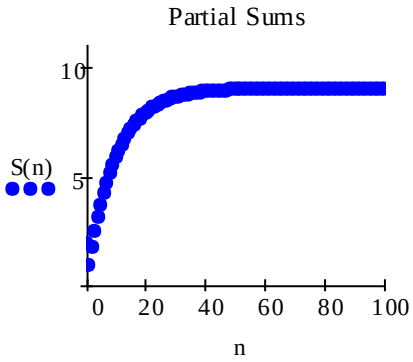
Here we'll use 2 separate graphs

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:

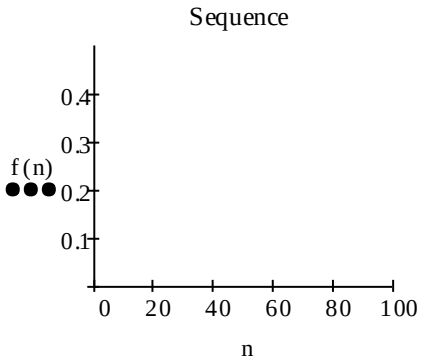
$n := 1..FRAME$

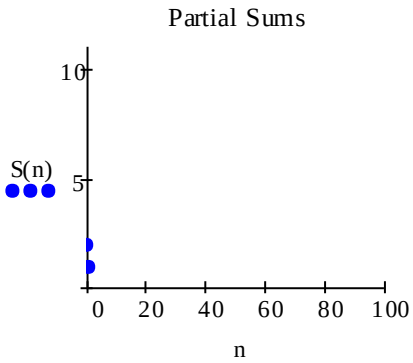
$N := FRAME + 1$ We define N to show the Nth term of the sequence and the Nth Partial Sum

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

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

$N = 1$ $f(N) = 0.9$ $S(N) = 0.9$


Sequence
f(n)
0.4
0.3
0.2
0.1
0
20
40
60
80
100
n


Partial Sums
S(n)
10
5
0
20
40
60
80
100
n