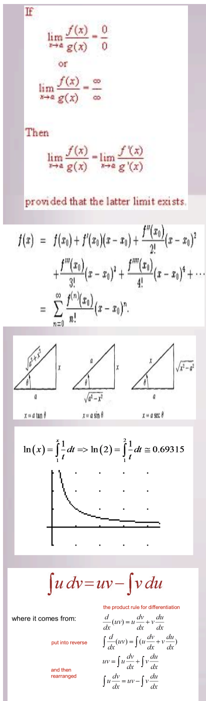

Sequence and Series Review

2,4,6,8,10,...	2,4,8,16,32,...
$a_n = a_1 + (n-1)d$	$a_n = a_1 r^{(n-1)}$
$\sum_{k=1}^{6} a_1 + (k-1)d$	$\sum_{k=1}^{6} a_1 r^{k-1}$
$S_n = \frac{n}{2}(a_1 + a_n)$	$S_n = a_1 \frac{1-r^n}{1-r}$

A ***sequence*** $\{a_n\}$ is a function such that the domain is the set of positive integers and the range is a set of real numbers.

Write five terms for each of these sequences:

$$a_n = \frac{n}{2n+1} \qquad\qquad a_n = \frac{(-2)^n}{n!}$$

A ***series*** is the sum of a sequence. $\sum_{k=1}^{n} a_k$

A ***partial sum*** is the sum of the first n terms.
An ***infinite sum*** is the sum from k= 1 to ∞.

Find these partial sums:

$$\sum_{k=0}^{3} \frac{(-2)^k}{k!} \qquad\qquad \sum_{k=1}^{5} \frac{k}{2k+1}$$

Arithmetic Sequence, Series

d = common difference

$$a_n = a_1 + (n-1)d$$

Geometric Sequence, Series

r = common ratio

$$a_n = a_1 r^{(n-1)}$$

partial sum

$$\sum_{k=1}^{n}(a_1 + (k-1)d\ )$$

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

$$\sum_{k=1}^{n} a_1 r^{k-1}$$

$$S_n = a_1 \frac{1-r^n}{1-r}$$

infinite sum

$$\sum_{k=1}^{\infty} a_1 r^{k-1}$$

$$S_\infty = \frac{a_1}{1-r}$$

Determine the sum for each of these:

$$\sum_{k=1}^{50} 2k-3$$

$$\sum_{k=1}^{\infty} \left(\frac{2}{3}\right)^k$$

Common Elements of Sequences/Series:

Odd numbers

Even numbers

Factorials

Alternating signs

Powers of 2

Arithmetic, Geometric or Neither?

n^{th} term 20^{th} term $a_n \to 0?$ $\sum_{k=1}^{\infty} a_k \to$ some value?

a) $1,1,2,3,5,8,13,.....$

b) $a_1 = 2, \ a_{n+1} = \frac{a_n}{n}$

c) $\frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \frac{1}{16}, ...$

d) $.9, .09, .009, .0009, ...$

Write a formula for the n^{th} term of these sequences.

e) $\frac{1}{2}, \frac{3}{4}, \frac{5}{6}, \frac{7}{8}, ...$

f) $\frac{1}{2}, \frac{1}{4}, \frac{1}{16}, \frac{1}{256}, ...$

g) $\frac{-2}{1}, \frac{8}{2}, \frac{-26}{6}, \frac{80}{24}, \frac{-242}{120}$