Geometric Series Look at this infinite series:

$$S = 1 - 1 + 1 - 1 + 1 - 1 + 1....$$

We ask: Does it have a sum? Multiply S through by -1 to get -S. Write down the expression for -S. What happens?

Now substract -S from S to get 2S. What happens to the terms of the series? Show how this allows you to "prove" that the sum is 1/2.

Now have a look at S like this:

$$S = (1 - 1) + (1 - 1) + (1 - 1) + (1 - ....$$

What do you think the sum is now?

Can you think of a way to group the elements so that the sum may be thought to be 1? Explain.

Here's another series. It is an example of a Geometric Series.

$$1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + ...$$

What is the pattern here?

- What is the sum of the first two terms?

- What is the sum of the first three terms?

- What is the sum of the first four terms?

- What is the sum of the first five terms?

- Do you think these "partial sums" getting closer and closer to some number? What is it?

- This is an example of a geometric series. What is the ratio of consecutive terms? What is THE (entire) sum?