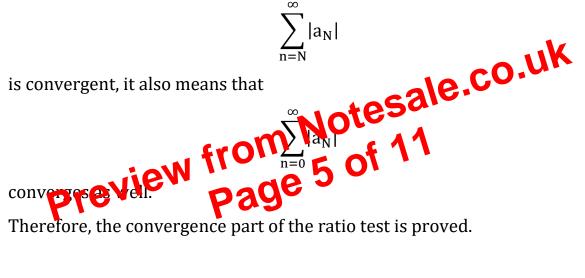
This can be rearranged into sigma notation:

$$\sum_{k=N}^{\infty} |a_N| = |a_N| \cdot \sum_{k=0}^{\infty} \mathbb{R}^n$$

geometric series

Since above we defined R < 1, and following this statement, the right-hand side always converges (property of geometric series). This proves that the series shown in the left-hand side also converges.

We took N to be any number which fulfilled the condition needed, so it is basically an arbitrary real number. Because of this, if



Problem 2

a)

We are going to check if the series below converges.

$$\sum_{k=0}^{\infty} (-1)^k \, \frac{1}{k+1}$$

This is an alternating series, therefore the most convenient way to check if it converges or not is the Liebniz alternating series test.