3A Summations

$$\sum_{r=1}^{n} 1 = n$$

$$\sum_{r=1}^{n} r = \frac{1}{2}n(n+1)$$

1. Calculate the sum of the series indicated below:

a)

$$\sum_{r=1}^{50} r$$

b)

$$\sum_{r=21}^{60} r$$

Splitting up Series:

$$\sum_{r=1}^{n}(ar + b) = a\sum_{r=1}^{n}r + b\sum_{r=1}^{n}1$$

2. Show that:

$$\sum_{r=1}^{n}(3r + 2)$$

Can be written as:

$$3\sum_{r=1}^{n}r + 2\sum_{r=1}^{n}1$$

3. Evaluate

$$\sum_{r=1}^{25}(3r + 1)$$

4.

a) Show that

$$\sum_{r=1}^{n}(7r - 4) = \frac{n}{2}(7n - 1)$$

b) Hence, calculate the value of:

$$\sum_{r=20}^{50}(7r - 4)$$