

1. For each series below:

(i) Find  $a_2$  and  $a_3$ ;  $S_2$  and  $S_3$ .

(ii) Does the series converge or diverge? If it converges, find the value to which it converges.

$$(a) \sum_{k=0}^{\infty} \frac{4}{3^k} \quad (b) \sum_{k=0}^{\infty} \frac{3^k}{(-4)^k}$$

2. For each series below, does the series converge or diverge? If it does converge, find the value to which it converges. *Note in each case where the series starts!*

$$(a) \sum_{k=2}^{\infty} \frac{5^k}{2^k} \quad (b) \sum_{k=42}^{\infty} \frac{1}{5^k}$$

Do the following series converge or diverge?

1. 
$$\sum_{k=1}^{\infty} \frac{2k^2 - 3}{5k^2 + 6k}$$

2. 
$$\sum_{k=98}^{\infty} \frac{3^k + \sin(k)}{\cos(k) + 5}$$

3. 
$$\sum_{k=2}^{\infty} \frac{5^k - 6k - 27}{7^k + 14k^2 + k}$$