

I. Do the following series converge or diverge? If the series converges, use Maple's 'Sum' command to calculate  $S_{100}$ .

1. 
$$\sum_{k=1}^{\infty} \frac{10}{2^k + 2}$$

2. 
$$\sum_{k=2}^{\infty} \frac{4^k}{3^k - 5}$$

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

II. For each series that converges, determine how close  $S_{100}$  is to the actual value of the series by bounding the tail  $R_{100}$ .

Hint: Find a geometric series that is larger than  $R_{100}$

III. Show that  $\sum_{k=3}^{\infty} \frac{2^k}{5^k + 6k}$  converges and approximate the series within  $10^{-10}$  of its actual value.