

Written HW10 – MATH 2502 Spring 2021

**Due by 22 March for timely completion credit**

1. Is the following series convergent or divergent? Why? If convergent, then compute the sum:  $\sum_{k=3}^{\infty} \left(-\frac{3}{8}\right)^k + 4$ .
2. Is the following series convergent or divergent? Why? If convergent, then compute the sum:  $\sum_{k=0}^{\infty} (-\pi)^k$ .
3. The following series is telescoping:  $\sum_{k=0}^{\infty} \frac{2}{(k+2)(k+3)}$ . Use partial fractions to rewrite the series as an infinite sum of two different terms. Use that to write out the first six terms of the series and show how the telescoping yields cancellation of terms. After that, find the partial sum  $S_N = \sum_{k=0}^N \frac{2}{(k+2)(k+3)}$  (it should only consist of two terms). Use that partial sum to find the value of the series.