

Homework 7

due October 28, 2015

In addition to

11.2 5, 11, 12, 15, 18, 19, 22, 24, 27, 30, 31, 34, 40, 42, 46, 48, 50, 53, 57, 64, 70, 72, 83, 84, 85

11.3 1, 2, 3, 5, 8, 10, 12, 13, 14, 15, 22, 24, 26, 28, 31, 34, 36, 44

11.4 1, 2, 3, 5, 13, 15, 22, 24, 26, 28, 30, 31, 33, 36, 43, 44

complete the following problem.

Challenge problem. Consider the series

$$\sum_{n=1}^{\infty} \frac{1}{n^2 + 4n + 3}.$$

(a) Does the series converge or diverge? Show.

(b) Use trial-and-error to find a general formula for the partial sum s_n . **Hint:** Use a partial fractions expansion, then write down the first half dozen terms; do you notice a pattern?

(c) Prove that your formula is correct using induction.

(d) If the series converges, use the formula for the partial sum s_n to find the sum of the series.

TO BE GRADED

11.2. 12, 15, 24, 34, 40, 42, 48, 57, 72, 85

11.3. 2, 8, 14, 15, 22, 24, 26, 28, 31, 36

11.4. 2, 24, 26, 28, 30, 31, 33, 36, 44

Challenge problem