1. Determine (all) values of $p \in \mathbb{R}$ for which the following series converges. HINT: Integral Test.

$$\sum_{n=1}^{\infty} \frac{\ln n}{n^p}$$

ANSWER: The series $\sum_{n=1}^{\infty} \frac{\ln n}{n^p}$ converges if and only if _____ .
Fill in the line with some condition on p and then *justify your answer below.*

2. Find the sum of the (telescoping) series

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

HINT: $\frac{2}{n^2+2n} = \frac{1}{n} - \frac{1}{n+2}$.