1. $\sum_{n=2}^{\infty} (-1)^{n+1} \frac{1}{\ln n}$. Does it diverge, converge conditionally or converge absolutely? (4 pts)

2. $\sum_{n=1}^{\infty} (-1)^n n^2 (2/3)^n$
   a). Justify that it converges absolutely. (Use ratio test) (4 pts)
   b). Estimate the error if I use $S_{10}$ to approximate the sum. (2 pts)
Bonus: Determine the $p$ values such that
\[
\sum_{n=2}^{\infty} \frac{1}{n^p (\ln n)^2}
\]
converges. (2 pts)