Instructions. Show all work, with clear logical steps. No work or hard-to-follow work will lose points.

Problem 1. (4 points) Determine whether the following integral converges or diverges. If it converges, compute it.

$$\int_2^\infty \frac{1}{x(\ln x)^{3/2}}.$$

Problem 2. (3 points each) Determine whether the following series converge or diverge. State why or why not. If the series converges, compute the sum.

(a) $\displaystyle\sum_{n=0}^{\infty} \left(\frac{3}{2}\right)^n$ (b) $\displaystyle\sum_{n=1}^{\infty} \frac{1}{2^{n+1}}$

Recall. If $|r| < 1$, then

$$\sum_{n=0}^{\infty} ar^n = \frac{a}{1-r}.$$