A.1-1 Find a simple formula for the sum of the first n odd numbers:

$$\sum_{k=1}^{n}(2k-1)$$

A.2-1 Show that $\sum_{k=1}^{n} 1/k^2$ is bounded above by a constant.

A.2-2 Find an asymptotic upper bound on the summation

$$\sum_{k=0}^{\lfloor \lg n \rfloor} \lceil n/2^k \rceil.$$

A-1b Give asymptotically tight bounds on the following summations. Assume that $s \geq 0$ is a constant.

$$\sum_{k=1}^{n} \lg^s k$$