Problem 1:

Find the upper bound of sum $\sum_{i=1}^{n} \frac{1}{i}$ (Recall that ln0 is undefined)

Answer

Problem 2:

(a) Find the lower bound of sum $\sum_{i=1}^{n} i^5$ using an integral

Answer

(b) manually compute $\sum_{i=1}^{n} i^5$ for n = 8, and compare to the lower bound formula in part (a)

Answer

Problem 3:

Find the limit $lim_{n\to\infty} \frac{n2^n}{e^n}$ (recall $(2^n)' = 2^n * ln2$)

Answer

Problem 4:

(a) Discuss why for f(n) $= n * lg(n^k)$ and g(n) $= n * lg(n^m)$ are Θ of each other

Answer

(b) Solve $lim_{n\to\infty} \frac{f(n)}{g(n)}$

Answer