

① Estimate $\int_0^{1/2} \frac{dx}{1-x^5}$ to ~~two~~ five decimal places (using lower and upper bounds of an infinite series representation of the integral).

② Estimate $\sum_{k=1}^{\infty} \frac{1}{3k\sqrt{k}}$ to two decimal places.

Note: "to n decimal places" means the spread between lower and upper bound should be $< 10^{-n}$. ~~to the nearest 0.01~~

③ Estimate $\ln(10)$ to 1 decimal place. Hint: $\ln(10) = -\ln \frac{1}{10} = -\ln(1 - \frac{9}{10})$.