

- 1) Find $\sum_{n=2}^{\infty} \frac{1}{n(n-1)}$.
- 2) Show that $\sum_{n=1}^{\infty} \frac{1}{n^2}$ is converging.
- 3) Show that $\sum_{n=1}^{\infty} \frac{1}{n}$ is diverging.
- 4) State the range of p for which $\zeta(p) = \sum_{n=1}^{\infty} \frac{1}{n^p}$ is converging.
- 5) State and prove the comparison test.
- 6) Comment on the convergence of $\sum_{n=1}^{\infty} \frac{1}{n(n+1)}$.
- 7) Show that $\sum_{n=1}^{\infty} \frac{1}{n^2} = \frac{\pi^2}{6}$.(optional)