

3. (10 pts) Does $\sum_{n=1}^{\infty} \frac{\sqrt{n+1}}{n^2+3n+1}$ converge or diverge?

4. (10 pts) Does $\frac{1}{n-\sin n}$ converge or diverge?

5. (10 pts) Does $\sum_{n=1}^{\infty} (n^{-1.1} + n^{-0.9})$ converge or diverge?

6. (10 pts) Does $\sum_{n=1}^{\infty} \frac{n!}{2^{n^2}}$ converge or diverge?

7. (10 pts) Does $\sum_{k=1}^{\infty} k^3 e^{-k}$ converge or diverge?

8. (10 pts) Does $\sum_{n=1}^{\infty} \frac{2^{-1/n}}{n}$ converge or diverge?

BONUS (10 pts) Does $\sum_{n=1}^{\infty} (1 - \cos(1/n))$ converge or diverge?