

Show all work and make sure to give exact answers. Good luck, and enjoy your weekend!

Determine if the series converge or diverge and **justify** your answer (5 points each).

Extra Credit: Determine the value of any series which converges (2 points each).

1.
$$\sum_{n=1}^{\infty} \frac{(-1)^{n+1}}{3^n}$$

2.
$$\sum_{n=1}^{\infty} \frac{1}{1+n^2}$$

3.
$$\sum_{n=1}^{\infty} \frac{n}{1+n^2}$$

4.
$$\sum_{n=1}^{\infty} \left(\frac{3}{2}\right)^n$$