

1. (1 point) Determine whether the following geometric series converges. If it does, find its sum.

$$\sum_{n=2}^{\infty} \frac{18}{3^n}$$

- (a) 3
- (b) 6
- (c) 9
- (d) 27
- (e) Does not converge

2. (1 point) Which of the following series is a convergent  $p$ -series?

(a)  $\sum_{n=1}^{\infty} \frac{1}{n}$

(b)  $\sum_{n=1}^{\infty} \frac{1}{n^{-1/2}}$

(c)  $\sum_{n=1}^{\infty} \frac{1}{n^{3/4}}$

(d)  $\sum_{n=1}^{\infty} \frac{1}{n^{5/4}}$

(e)  $\sum_{n=1}^{\infty} \frac{1}{n^{0.99}}$

3. (1 point) Determine which statement best justifies the behavior of the series

$$\sum_{n=3}^{\infty} \frac{7}{4^n - n^2}.$$

This series:

- (a) Converges by direct comparison with  $b_n = \frac{7}{4^n}$ .
- (b) Converges by limit comparison with  $b_n = \frac{1}{4^n}$ .
- (c) Converges by limit comparison with  $b_n = \frac{1}{n^2}$ .
- (d) Converges because it is a geometric series with common ratio  $r = \frac{1}{4}$ .
- (e) Diverges by the divergence test.

4. (4 points) Determine whether the following series converges or diverges. Fully justify your answer.

$$\sum_{n=2}^{\infty} \frac{1}{n \ln(n)}$$

5. (3 points) Do you have any questions or comments about the course so far?