

MATH 214 A1, Fall 2013, Practice Questions 1

1. Determine whether or not each of the following sequences converges. If it does, calculate its limit.

(a) $a_n = \frac{n^2 - 1/n}{n + 1}$ (b) $b_n = \frac{n}{n^2 + \sin(n)}$ (c) $c_n = \frac{(-1)^n}{n^2}$ (d) $d_n = n^{-1/n}$

2. Determine whether or not each of the following sequences converges. If it does, calculate its limit.

(a) $a_n = \left(-\frac{3}{4}\right)^n$ (b) $b_n = \left(-\frac{4}{3}\right)^n$ (c) $c_n = \cos(\pi n)$ (d) $d_n = \sin(\pi n)$

3. Determine whether each of the following series converges or diverges. If it converges, calculate the sum.

(a) $\sum_{n=2}^{\infty} (-3)^{n-1} 4^{-n}$ (b) $\sum_{n=0}^{\infty} (-4)^{n-1} 3^{-n}$ (c) $\sum_{n=2}^{\infty} 3^{1/n} 4^n$ (d) $\sum_{n=1}^{\infty} 3^{1/n} 4^{1/n}$