

Due Tuesday, October 10th at the beginning of class. Write your solutions on separate paper.

SHOW YOUR WORK!

Determine whether the sequence converges or diverges. If it converges, find its limit.

1. $a_n = \frac{e^n + e^{-n}}{e^{2n} - 1}$

2. $b_n = \ln(2n^2 + 1) - \ln(n^2 + 1)$

3. $c_n = \sqrt[n]{2^n + 3^n}$

4. $d_n = \frac{\sin(n) \ln n}{n}$

Determine whether the series is convergent or divergent. If it converges find the sum.

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

2. $\sum_{k=1}^{\infty} \ln \left(1 + \frac{1}{k} \right)$

3. $\sum_{m=1}^{\infty} \frac{m(m+2)}{(m+3)^2}$

4. $\sum_{j=1}^{\infty} [(0.8)^{j-1} - (0.3)^j]$

Try these more challenging problems from the text.

1. [Section 8.1, problem 55]

2. [Section 8.2, problem 58]

3. [Section 8.2, problem 68]

Answer: $11\pi/96$.

Hint: If $(r_n)_{n=0}^{\infty}$ is the sequence of radii of the successively smaller circles, then the ratio r_{n+1}/r_n is constant.