King Fahd University of Petroleum and Minerals
Quiz 3 Math 102-112 Duration 40 minutes

Full Name: ID:
Section:

Question 1 Determine whether the following series are convergent or divergent. Justify your answer.

$$a)\ \sum_{n=2}^{\infty} \frac{1}{n\left(\sqrt{\ln n}\right)}, \quad b)\ \sum_{n=3}^{\infty} \cos(\pi/n)\left(\frac{n+1}{n}\right)^{n}, \quad c)\ \sum_{n=1}^{\infty} \sin\left(\frac{(-1)^n}{n}\right).$$

Question 2 Find the interval of convergence of the power series $\sum_{n=1}^{\infty} \frac{(2x+\mathrm{e})^n}{n\mathrm{e}^n}$.

Question 3 Find the sum of the following series if possible. Justify your answer.

$$a)\ \sum_{n=2}^{\infty} 5^{1-n}2^{2n+1} \qquad b)\ \sum_{n=1}^{\infty} \ln\left(1-\frac{2}{2n+1}\right).$$

Question 4 Let $S = \sum_{n=5}^{\infty} \frac{(-1)^n}{\sqrt[3]{n}}$ and let S_n be the partial sum of the first n terms. Find the minimum (integer) value of n such that $|S - S_n| < 0.1$.