3. Homework

Show all your work! Justify our answers!

Read section 11.4-6, and work the problems
Sec. 11.4, #’s 6, 12, 30;
Sec. 11. 5 #’s 5, 8, 15
Sec. 11. 6 #’s 26, 34, 36.

and

1) Show that if \( a_n > 0 \) and \( \sum_{n=1}^{\infty} a_n \) is convergent then
\[
\sum_{n=1}^{\infty} \sin(a_n)
\]
is convergent.

2) Determine whether \( \sum_{n=1}^{\infty} (-1)^n(1-\epsilon^{1/n}) \) is convergent or divergent. If it is convergent find an integer \( n \) such that the remainder \( R_n \) is less than \( 10^{-3} \).

3) Determine whether the following series is divergent, conditional convergent or absolutely convergent.
\[
\sum_{n=1}^{\infty} (-1)^n \frac{(\ln n)^2}{n}.
\]

4) Determine whether the following series is divergent, conditional convergent or absolutely convergent.
\[
\sum_{n=1}^{\infty} (-1)^n \frac{(n!)^2}{(2n)!}.
\]