Homework Set 4

DUE: OCT 25, 2021 (VIA BLACKBOARD, BY 11.59PM)

To be handed in:

Please remember that all problems will be graded!

1. Use one of the convergence tests we discussed during lectures to justify whether each of the following series *converges* (and, if so, *absolutely*?) or *diverges*.

   (a) $\displaystyle\sum_{n=1}^{\infty} 3n^2\, e^{-n^3}$

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

   (c) $\displaystyle\sum_{n=1}^{\infty} (-1)^{n+1}\, \frac{n^2}{2^n}$

   (d) $\displaystyle\sum_{n=1}^{\infty} \left[\sin\left(\frac{n\pi}{7}\right)\right]^n$

   (e) $\displaystyle\sum_{n=1}^{\infty} \left[\sin\left(\frac{n\pi}{8}\right)\right]^n$

   (f) $\displaystyle\frac{1}{\pi} + \frac{1}{5} + \frac{1}{\pi^2} + \frac{1}{5^2} + \frac{1}{\pi^3} + \frac{1}{5^3} + \frac{1}{\pi^4} + \frac{1}{5^4} + \dots$