

12. [6 points] For each of the questions below, circle all of the available correct answers. Circle “NONE OF THESE” if none of the available choices are correct. You must circle at least one choice to receive any credit. No credit will be awarded for unclear markings. No justification is necessary.

a. [2 points] Which of the following converge to the number $\int_0^{\pi/2} e^{-x^2} dx$?

i. The sequence LEFT(n) of approximations of $\int_0^{\pi/2} e^{-x^2} dx$, for $n \geq 1$.

ii. The sequence $\int_{1/n}^{\pi/2} e^{-x^2} dx$ for $n \geq 1$

iii. The series $\sum_{n=0}^{\infty} \frac{(-1)^n (\pi^{2n+1})}{(2n+1)(2^{2n+1})(n!)}$

iv. NONE OF THESE

b. [2 points] Consider the sequence $a_n = \frac{1}{\ln(n)}$, $n \geq 2$. Which of the following statements are true?

i. $\lim_{n \rightarrow \infty} a_n = 0$.

ii. The series $\sum_{n=2}^{\infty} a_n$ converges.

iii. The series $\sum_{n=2}^{\infty} a_n$ diverges.

iv. The series $\sum_{n=2}^{\infty} (-1)^n a_n$ converges.

v. NONE OF THESE

c. [2 points] Which of the following series are conditionally convergent?

i. $\sum_{n=1}^{\infty} \frac{(-1)^n}{n}$

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

iii. $\sum_{n=1}^{\infty} \frac{(-1)^n}{3^n}$

iv. NONE OF THESE