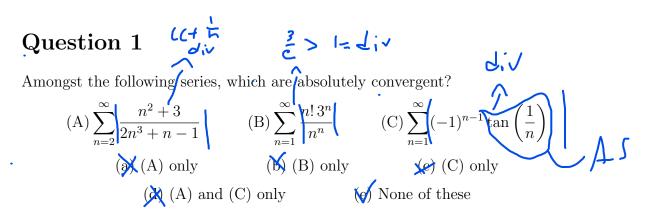


CSD2201/2200 Week 13 Homework

Due: 30th November 2023, 2359 HRS

For each question, key in the correct option into the homework into the "Week 13" Homework" option in the "20 November to 26 November" section in our combined CSD2201 and CSD2200 meta course page on Moodle.



Question 2 ACT - F

Amongst the following series, which are conditionally convergent?

(A) $\sum_{n=1}^{\infty} (-1)^n \frac{n^2}{3n^3+1}$ (B) $\sum_{n=1}^{\infty} \frac{\cos(n\pi)}{n^2}$ (C) $\sum_{n=1}^{\infty} (-1)^n \sin\left(\frac{1}{n}\right)$ (b) (A) and (C) only (c) (B) and (C) only (a) (A) only (d) (A) and (B) only (e) All of these

Question 3

Find the radius of convergence of $\sum_{n=1}^{\infty} \frac{(-1)^n x^{3n}}{n \, 27^n}$. (a) ∞ (b) 3 (c) $\sqrt{27}$ (d) 27 (e) None of these

(a)
$$\infty$$



(c)
$$\sqrt{27}$$



Question 4

Find the radius of convergence of $\sum_{n=1}^{\infty} \frac{(4x-5)^{2n}}{\sqrt{n} \, 25^n}.$

- (a) ∞

- (b) 25 (c) 5 $(d) \frac{5}{4}$
- (e) None of these

Question 5

Find the radius of convergence of $\sum_{n=0}^{\infty} \frac{(3n)!}{23^n (n!)^3} (7x-2)^n.$

- (a) ∞
- (b) $\frac{27}{23}$ (c) $\frac{23}{27}$
- (e) None of these

Question 6

Given that the *n*-th order derivatives of a function f at a=3 are

$$f^{(n)}(3) = \frac{(2n+1)}{4^n},$$

find the radius of convergence of the Taylor series of f centered at a.



- (d) 2
- (e) None of these

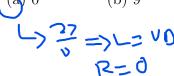
(b) 4 (c) $\frac{4}{3}$ Question 7

Given that the *n*-th order derivatives of a function f at a=4 are

$$f^{(n)}(4) = \frac{(3n+1)!}{9^n},$$

find the radius of convergence of the Taylor series of f centered at a.

- (c) 27
- (d) $\frac{9}{4}$
 - (e) None of these



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