



Dashboard » Mathematics » Mathematics for Engineering - MAE101 » MAE101-HuynhTT » Chapter 8 - Series » Q4* » Preview

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Marks 0.00/50.00

Grade 0.00 out of 10.00 (0%)

Question 1

Not answered

Marked out of 1.00

What are all values of x for which the series $\sum_{n=1}^{\infty} \frac{(x+2)^n}{\sqrt{n}}$ converges?

Select one:

- a. $-3 < x < -1$
- b. $-1 < x < 1$
- c. $-3 \leq x \leq -1$
- d. $-3 \leq x < -1$

Question 2

Not answered

Marked out of 1.00

Find the linear approximation for $f(x) = \frac{1}{2x-1}$ at $x = 1$

Select one:

- a. None of the others
- b. $-2x + 3$
- c. $2x + 3$
- d. $-2x - 3$
- e. $2x - 3$

Question 3

Not answered

Marked out of 1.00

Find the derivative of the function $g(x) = \int_x^{x^3} \sin t dt$

Select one:

- a. $3x^2 \sin x^3 + \sin x$
- b. $3x^2 \cos x^3 - \cos x$
- c. $\sin x^3 - \sin x$
- d. $3x^2 \sin x^3 - \sin x$

Question 4

Not answered

Marked out of 1.00

Find $\frac{d^4 y}{dx^4}$ for $y = \sqrt[3]{x}$

Select one:

- a. $-\frac{80}{81x^{7/3}}$
- b. $\frac{80}{81x^{11/3}}$
- c. $-\frac{80}{81x^{11/3}}$
- d. $\frac{80}{81x^{7/3}}$

Question 5

Not answered

Marked out of 1.00

Study the statements.

(i) $\int_1^{\infty} \frac{1}{x} dx$ and $\int_1^{\infty} \frac{1}{u} du$ are the same

(ii) If $\int_1^{\infty} f(x) dx$ converges then $\int_2^{\infty} f(x) dx$ converges

Then, (i) is ____ and (ii) is ____

Select one:

- a. true, false
- b. false, false
- c. false, true
- d. true, true

Question 6

Not answered

Marked out of 1.00

Let $\int_1^3 f(x)dx = -2$ and $\int_3^1 g(x)dx = 3$. Find $\int_1^3 (3f(x) - g(x))dx$

Select one:

- a. 3
- b. -6
- c. -3
- d. -9
- e. None of the others

Question 7

Not answered

Marked out of 1.00

If $\lim_{b \rightarrow \infty} \int_1^b \frac{dx}{x^p}$ is finite, then which of the following must be true?

Select one:

- a. $\sum_{n=1}^{\infty} \frac{1}{n^p}$ diverges
- b. $\sum_{n=1}^{\infty} \frac{1}{n^{p-2}}$ converges
- c. $\sum_{n=1}^{\infty} \frac{1}{n^p}$ converges
- d. $\sum_{n=1}^{\infty} \frac{1}{n^{p-1}}$ converges

Question 8

Not answered

Marked out of 1.00

Which of the following integrals is/are convergent?

(i) $\int_1^{\infty} \frac{2010}{5x^2} dx$

(ii) $\int_1^{\infty} \frac{1}{\sqrt{x^3}} dx$

(iii) $\int_0^{\infty} e^{-x} dx$

Select one:

- a. (i), (ii) and (iii)
- b. None of the others
- c. (ii) and (iii) only
- d. (i) and (ii) only
- e. (i) and (iii) only

Question 9

Not answered

Marked out of 1.00

Find all the numbers c that satisfy the conclusion fo Rolle' s Theorem

$$f(x) = x\sqrt{x+3}; [-3; 0]$$

Select one:

- a. -2
- b. -1
- c. -3 and 0
- d. -3 and -1
- e. -2 and 0

Question **10**

Not answered

Marked out of 1.00

Which of the following series converge?

I. $\sum_{n=1}^{\infty} \frac{n}{n+2}$

II. $\sum_{n=1}^{\infty} \frac{\cos(n\pi)}{n}$

III. $\sum_{n=1}^{\infty} \frac{1}{n}$

Select one:

- a. I and III only
- b. None
- c. II only
- d. I and II only
- e. III only

Question **11**

Not answered

Marked out of 1.00

Find the most general antiderivative of $f(x) = \sqrt[3]{8x^8}$

Select one:

- a. $2/9 \cdot x^9 + C$
- b. $16/3 \cdot x^{1/3} + C$
- c. $6/11 \cdot x^{11/3} + C$
- d. $22/3 \cdot x^{11/3} + C$

Question **12**

Not answered

Marked out of 1.00

Each side of square is increasing at rate of 3 cm/s. At what rate (in cm^2/s) is the area of the square increasing when the area of square is 25cm^2 ?

Select one:

- a. 30
- b. None of the others
- c. 5
- d. 25
- e. 15

Question **13**

Not answered

Marked out of 1.00

If $\sum_{n=0}^{\infty} a_n x^n$ is a Taylor series that converges to $f(x)$ for all real x , then $f'(1) =$

Select one:

a. a_1

b. $\sum_{n=1}^{\infty} n a_n$

c. $\sum_{n=0}^{\infty} a_n$

d. $\sum_{n=1}^{\infty} n a_n^{n-1}$

Question **14**

Not answered

Marked out of 1.00

Given the sequence defined by $a_1 = \sqrt{3}$, $a_{n+1} = \sqrt{3 + a_n}$. Determine the limit, if it exists

Select one:

a. $\frac{1+\sqrt{13}}{2}$

b. $-1/2$

c. $\frac{1-\sqrt{13}}{2}$

d. $5/2$

e. does not exist

Question **15**

Not answered

Marked out of 1.00

The interval of convergence of $\sum_{n=0}^{\infty} \frac{(x-1)^n}{3^n}$ is

Select one:

- a. $-2 \leq x \leq 4$
- b. $-2 \leq x < 4$
- c. $-3 \leq x \leq 3$
- d. $-2 < x < 4$

Question **16**

Not answered

Marked out of 1.00

Find the relative extreme value of the function $f(x) = \frac{4}{x^2-1}$

Select one:

- a. Relative maximum = -4. No relative minimum
- b. Relative minimum = 4. No relative maximum
- c. Relative minimum = -4. No relative maximum
- d. Relative maximum = 4. No relative minimum

Question **17**

Not answered

Marked out of 1.00

For what integer k , $k > 1$, will both $\sum_{n=1}^{\infty} \frac{(-1)^{kn}}{n}$ and $\sum_{n=1}^{\infty} \left(\frac{k}{4}\right)^n$ converge?

Select one:

- a. 5
- b. 3
- c. 4
- d. 2
- e. does not exist

Question 18

Not answered

Marked out of 1.00

Let $f(x) = \int_{2x}^{3x} e^{t^2} dt$. Find $f'(0)$

Select one:

- a. 0
- b. 5
- c. -1
- d. 1
- e. 2

Question 19

Not answered

Marked out of 1.00

Evaluate the improper integral $\int_0^1 \frac{1}{\sqrt{x}} dx$ (if it converges).

Select one:

- a. None of the others
- b. 1
- c. It diverges
- d. 1/2
- e. 2

Question 20

Not answered

Marked out of 1.00

Use the Midpoint Rule with $n = 4$ to estimate the value of the integral $\int_0^2 f(x) dx$

x	0	0.25	0.5	0.75	1	1.25	1.5	1.75	2
f(x)	1	0.61	0.49	0.42	0.37	0.33	0.29	0.27	0.24

Select one:

- a. 0.695
- b. 0.815
- c. 1.16
- d. None of the others
- e. 1.075

Question **21**

Not answered

Marked out of 1.00

Find the absolute maximum and absolute minimum values of the function

$$f(x) = x^4 - 32x^2 + 2 \text{ on } [-5; 5]$$

Select one:

- a. absolute maximum 2, absolute minimum -254
- b. absolute maximum 2, absolute minimum -173
- c. None of the others
- d. absolute maximum 2, absolute minimum 0

Question **22**

Not answered

Marked out of 1.00

What is the approximation of the value of $\sin 1$ obtained by using the fifth-degree Taylor polynomial about $x = 0$ for $\sin x$?

Select one:

- a. $1 - 1/2 + 1/24$
- b. $1 - 1/2 + 1/4$
- c. $1 - 1/6 + 1/120$
- d. $1 - 1/3 + 1/5$
- e. $1 - 1/4 + 1/8$

Question **23**

Not answered

Marked out of 1.00

Find $f \circ g \circ h$, where $f(x) = 2x + 1$; $g(x) = \sin(x^2)$; $h(x) = e^{-x}$

Select one:

- a. $2\sin(e^{-2x} + 1)$
- b. $2\sin(x^2 e^{-x}) + 1$
- c. $2\sin(x^2 e^{-2x} + 1)$
- d. $2\sin(e^{-2x}) + 1$

Question **24**

Not answered

Marked out of 1.00

Use Newton's method with the specified initial approximation $x_1 = 2$ to find x_3 of the following equation

$$\ln(x^2 + 4) - 2x = 0$$

Select one:

- a. 0.71696
- b. 0.76054
- c. 0.71963
- d. 0.76070

Question **25**

Not answered

Marked out of 1.00

Evaluate $\int 7pe^{5p^2} dp$

Select one:

- a. $\frac{7}{5}e^{5p^2} + C$
- b. $-\frac{7}{10}e^{5p^2} + C$
- c. $\frac{7}{10}e^{5p^2} + C$
- d. $35e^{5p^2} + C$

Question **26**

Not answered

Marked out of 1.00

Which of the following series diverge?

I. $\sum_{k=3}^{\infty} \frac{2}{k^2 + 1}$

II. $\sum_{k=1}^{\infty} \left(\frac{6}{7}\right)^k$

III. $\sum_{k=2}^{\infty} \frac{(-1)^k}{k}$

Select one:

- a. III only
- b. I only
- c. II only
- d. II and III only
- e. None

Question **27**

Not answered

Marked out of 1.00

Evaluate $\int_0^{\pi/2} \frac{\sqrt{\sin x}}{\sqrt{\sin x} + \sqrt{\cos x}} dx$

Select one:

- a. 1/2
- b. $\pi/4$
- c. 1/4
- d. None of the others
- e. $\pi/2$

Question **28**

Not answered

Marked out of 1.00

Find the interval of convergence of the power series

$$\sum_{n=1}^{\infty} \frac{(x-1)^n}{n2^n}$$

Select one:

- a. (-1;3)
- b. (-1;3]
- c. [-2;2]
- d. [-1;3]
- e. [-1;3)

Question **29**

Not answered

Marked out of 1.00

Choose the correct statement:

- I. If $\lim a_n \neq 0$ then the series $\sum a_n$ is divergent.
- II. If $\{a_n\}$ and $\{b_n\}$ are divergent then $\{a_n + b_n\}$ is divergent.

Select one:

- a. II only
- b. both
- c. I only
- d. None

Question 30

Not answered

Marked out of 1.00

At which points on the curve $y = 4 - 4x + 10x^3 - x^5$ does the tangent line have the largest slope ?

Select one:

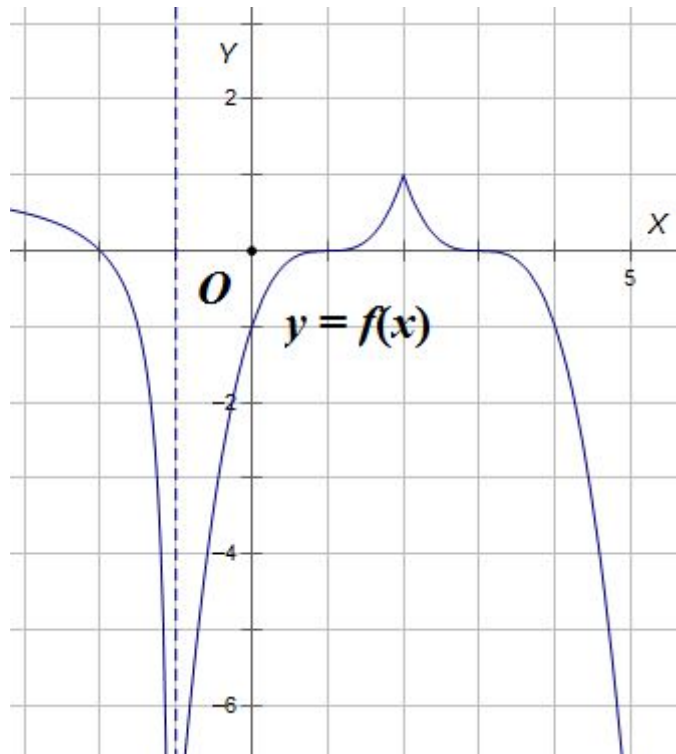
- a. $x = -\sqrt{3}$
- b. $x_1 = \sqrt{3}$ and $x_2 = -\sqrt{3}$
- c. $x = 3$
- d. $x = 0$
- e. $x = \sqrt{3}$

Question 31

Not answered

Marked out of 1.00

The graph of $f(x)$ is given. State the numbers at which $f(x)$ is not differentiable



Select one:

- a. 2
- b. 1; 3
- c. -1; 1; 2; 3
- d. -1; 2

Question **32**

Not answered

Marked out of 1.00

If $s_n = \left(\frac{(5+n)^{100}}{5^{n+1}} \right) \left(\frac{5^n}{(4+n)^{100}} \right)$, to what number does the sequence $\{s_n\}$ converge?

Select one:

- a. The sequence does not converge
- b. 5/4
- c. 1
- d. 1/5

Question **33**

Not answered

Marked out of 1.00

Which of the following integrals is convergent

I. $\int_1^{\infty} \frac{1+e^{-x}}{x} dx$

II. $\int_1^{\infty} \frac{1}{x^2} dx$

Select one:

- a. None
- b. Both
- c. I only
- d. II only

Question **34**

Not answered

Marked out of 1.00

Estimate the area of under the graph of $f(x) = 18 - 2x^2$ from $x = 0$ to $x = 3$, using three approximating rectangles and right endpoints.

Select one:

- a. 44
- b. 40
- c. 26
- d. 28

Question **35**

Not answered

Marked out of 1.00

The coefficient of x^3 in the Taylor series for e^{3x} about $x = 0$ is

Select one:

- a. 1/6
- b. 9/2
- c. 1/2
- d. 1/3
- e. 3/2

Question **36**

Not answered

Marked out of 1.00

Find all the constant c that makes g discontinuous at $x = 4$

$$g(x) = \begin{cases} x^2 + c^2 & \text{if } x < 4 \\ cx + 13 & \text{if } x \geq 4 \end{cases}$$

Select one:

- a. All c values except $c = 3$ and $c = 4$
- b. All c values except $c = 1$ and $c = 3$
- c. All c values except $c = 0$ and $c = 3$
- d. All c values except $c = 1$ and $c = 4$
- e. None of the others

Question **37**

Not answered

Marked out of 1.00

Find the average value of the function $f(x)$ in the interval $[-1, 2]$,

$$f(x) = 3x^2 - 2x + 3$$

Select one:

- a. 0
- b. 15
- c. 5
- d. $\pi/6$
- e. $\pi/5$

Question **38**

Not answered

Marked out of 1.00

Find dy/dx by implicit differentiation if $2xy + y^3 = 5$

Select one:

- a. $\frac{2y}{3y^2 - 2x}$
- b. $\frac{2y}{3y^2 + 2x}$
- c. $\frac{-2y}{3y^2 + 2x}$
- d. $\frac{-2y}{3y^2 - 2x}$

Question **39**

Not answered

Marked out of 1.00

Determine if the series $\sum_{n=1}^{\infty} \frac{(-1)^n}{\sqrt{n}}$ is absolutely convergent, conditionally convergent or divergent

Select one:

- a. divergent
- b. conditionally convergent
- c. absolutely convergent

Question **40**

Not answered

Marked out of 1.00

If $\int_1^5 u'(x) dx = 13$ and $u(1) = 3$. Find the value of $u(5)$.

Select one:

- a. 16
- b. 10
- c. 39
- d. None of the others
- e. -10

Question **41**

Not answered

Marked out of 1.00

Determine if the series converges or diverges:

$$\sum_{n=1}^{\infty} \frac{4 + \cos n}{n}$$

Select one:

- a. Diverges
- b. Converges

Question **42**

Not answered

Marked out of 1.00

Describe how the graph of $y = f(x + 2) + 3$ is obtained from the graph of $y = f(x)$

Select one:

- a. Shift 3 units to the left, then shift 2 units up
- b. Shift 2 units to the left, then shift 3 units down
- c. Shift 2 units to the right, then shift 3 units up
- d. Shift 3 units to the left, then shift 2 units down
- e. Shift 2 units to the left, then shift 3 units up

Question **43**

Not answered

Marked out of 1.00

Evaluate

$$\lim_{x \rightarrow +\infty} \frac{3x\sqrt{x+2} + 5}{(4x-1)\sqrt{x}}$$

Select one:

- a. 0
- b. Infinity
- c. 5/4
- d. 3/4
- e. 4/3

Question **44**

Not answered

Marked out of 1.00

A table of values for f , g , f' , g' is given

x	$f(x)$	$g(x)$	$f'(x)$	$g'(x)$
0	1	1	2	-2
1	0	2	3	-1
2	4	-1	5	6

Find $h'(0)$ if $h(x) = f(g(x))$.

Select one:

- a. 2
- b. 5
- c. -6
- d. 0

Question **45**

Not answered

Marked out of 1.00

What are all values of x for which the series $\sum_{n=1}^{\infty} \frac{(x-2)^n}{n \cdot 3^n}$ converges?

Select one:

- a. $-1 \leq x < 5$
- b. $-1 < x \leq 5$
- c. $-3 \leq x \leq 3$
- d. $-3 < x < 3$
- e. $-1 \leq x \leq -5$

Question **46**

Not answered

Marked out of 1.00

The coefficient of x^6 in the Taylor series expansion about $x = 0$ for $f(x) = \sin(x^2)$ is

Select one:

- a. $1/120$
- b. $1/6$
- c. 0
- d. $-1/6$

Question **47**

Not answered

Marked out of 1.00

For $y = \frac{1}{x^7+2}$, find $y'(1)$

Select one:

- a. 5/9
- b. 7/9
- c. -5/9
- d. -7/9
- e. 0

Question **48**

Not answered

Marked out of 1.00

The sum of the infinite geometric series $\frac{3}{2} + \frac{9}{16} + \frac{27}{128} + \frac{81}{1,024} + \dots$ is

Select one:

- a. 2.35
- b. 2.5
- c. 2.4
- d. 1.6

Question **49**

Not answered

Marked out of 1.00

Evaluate $\int_0^{\pi/2} \sin x \cos x \cdot e^{\sin x} dx$

Select one:

- a. 1
- b. -1
- c. 0
- d. e

Question **50**

Not answered

Marked out of 1.00

Evaluate

$$\lim_{x \rightarrow 1} \frac{x^2 - 5x + 2}{x^4 + 8x + 7}$$

Select one:

- a. 3/8
- b. -1/8
- c. -3/8
- d. 0
- e. 1/8



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