Let R be the region in the plane enclosed by $y = \ln x$, $y = 0$, and $x = 2$.
Find the volume of the solid formed by rotating R about the axis $x = 3$.

A) $V = \pi \int_0^{\ln 2} \left((e^y + 3)^2 - 1\right) dy.$

B) $V = \pi \int_0^{\ln 2} \left(1 - (3 - e^y)^2\right) dy.$

C) $V = \pi \int_0^{\ln 2} \left((3 - e^y)^2 - 1\right) dy.$

D) $V = \pi \int_0^{\ln 2} \left(e^{2y} - 1\right) dy.$

E) None of the above.

○ A)

○ B)

○ C)

○ D)

○ E)

Which of the following series converge?

I. $\sum_{n=1}^{\infty} 7n^{\frac{-1}{2}}$ II. $\sum_{n=2}^{\infty} \frac{1}{n(\ln n)^2}$ III. $\sum_{n=1}^{\infty} \frac{3^n}{5^n+n}$

A) I only.

B) II only.

C) II and III.

D) III only.

E) None of them.

- A)
- B)
- C)
- D)
- E)

Let R be the region in the half plane $x \geq 0$ bounded by the curves

$$y = -5x + 5$$
$$y = x^2 - 1$$
$$x = 0$$

Compute the volume of the solid of revolution formed by rotating R about the vertical line $x = -2$.

A) $V = 2\pi \int_0^1 (x-2)[(-5x+5)-(x^2-1)]dx.$

B) $V = 2\pi \int_0^1 (x+2)[(x^2-1)-(-5x+5)]dx.$

C) $V = 2\pi \int_0^1 (x+2)[(-5x+5)-(x^2-1)]dx.$

D) $V = 2\pi \int_0^1 (x-2)[(x^2-1)-(-5x+5)]dx.$

E) None of the above.

- A)
- B)
- C)
- D)
- E)

Find the sum of the series:

$$\sum_{n=5}^{\infty} \frac{6}{n(n-3)}$$

or conclude that it diverges.

A) 0.

B) $\frac{11}{3}$.

C) $\frac{13}{3}$.

D) $\frac{13}{6}$.

E) Diverges.

A)

Question 11

Not yet answered

Marked out of 3

Flag question

Time left 0:03:47

Express the area of the surface obtained by rotating the curve

$y = \frac{1}{2}\ln\csc(2x)$ between $x = \frac{\pi}{6}$ and $x = \frac{\pi}{4}$ about the y-axis as an integral.

A) $\pi \int_{\frac{\pi}{6}}^{\frac{\pi}{4}} \csc(2x)\ln\csc(2x)\,dx.$

B) $\pi \int_{\frac{\pi}{6}}^{\frac{\pi}{4}} \ln\csc(2x)\sqrt{1+\frac{1}{4}\cot^2(2x)}\,dx.$

C) $2\pi \int_{\frac{\pi}{6}}^{\frac{\pi}{4}} x\csc(2x)\,dx.$

D) $2\pi \int_{\frac{\pi}{6}}^{\frac{\pi}{4}} x\sqrt{1+\frac{1}{4}\cot^2(2x)}\,dx.$

E) None of the above.

○ A)

○ B)

○ C)

Which of the following series converge?

I. $\sum_{n=1}^{\infty} \frac{1}{1+\frac{1}{n}}$ II. $\sum_{n=2}^{\infty} \frac{1}{\ln n^4}$ III. $\sum_{n=1}^{\infty} \frac{n}{\sqrt{n^2+1}}$

A) None of them.

B) I only.

C) II only.

D) III only.

E) II and III.

A)

Question 6

Not yet answered

Marked out of 1

Flag question

Time left 0:28:5

Express the arc length of the curve $y = \frac{x^4}{8} + \frac{x^{-2}}{4}$ between

$x = -3$ and $x = -1$ as an integral.

A) $\int_{-3}^{-1} \left(\frac{x^3}{2} + \frac{1}{2x^3}\right) dx.$

B) $\int_{-1}^{-3} \left(\frac{x^3}{2} + \frac{1}{2x^3}\right) dx.$

C) $\int_{-3}^{-1} \left(\frac{x^3}{2} - \frac{1}{2x^3}\right) dx.$

D) $\int_{-1}^{-3} \left(\frac{x^3}{2} - \frac{1}{2x^3}\right) dx.$

E) None of the above.

A)

B)

C)

D)

E)

Question 2

Not yet answered

Marked out of 3

Flag question

A solid is formed with a base that is a triangle with vertices at $(0,0)$, $(3,0)$ and $(0,1)$. Cross sections of this solid, perpendicular to the x –axis are squares. Find the volume of the solid.

A) $\frac{1}{2}$.

B) $\frac{1}{3}$.

C) 1.

D) $\frac{3}{2}$.

E) None of the above.

1

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out of

n

Assume the terms of a sequence $\{a_n\}_{n=1}^{\infty}$ are given by the following formula:

$$a_n = \frac{1}{3n^2} + \frac{2}{3n^2} + \frac{3}{3n^2} + \cdots + \frac{n}{3n^2}.$$

Find the limit of the sequence or conclude that it diverges.

Hint: $\sum_{i=1}^{n} i = \frac{n(n+1)}{2}$.

A) $\frac{1}{2}$.

B) $\frac{1}{3}$.

C) $\frac{1}{6}$.

D) 0.

E) Diverges.

A)

B)

C)

D)

E)

Find the sum of the series:

$$\sum_{n=1}^{\infty} \frac{2^{n-2} + 3^{n+1}}{4^n}$$

or conclude that it diverges.

A) $\frac{35}{4}$.

B) $\frac{37}{4}$.

C) $\frac{53}{2}$.

D) $\frac{55}{2}$.

E) Diverges.

A)

B)

C)

D)

Assume $\sum_{n=1}^{\infty} a_n$ is an infinite series with partial sums given by

$$S_N = 4 - \frac{2}{N}.$$

What is a_5?

A) $-\frac{1}{10}$.

B) $\frac{1}{10}$.

C) $-\frac{2}{5}$.

D) $\frac{2}{5}$.

E) None of the above.

A)

B)

C)

D)

E)

Clear my choice

Question 8

Not yet answered

Marked out of 2

Flag question

Let $\sum_{n=1}^{\infty} a_n$ be a series with partial sums S_N. If $a_n = f(n)$, where $f(x)$ is positive, continuous, and decreasing function. Which of the following statements are always true?

I. If $\sum_{n=1}^{\infty} a_n$ converges, then $\lim_{n\to\infty} a_n = 0$.

II. If $\sum_{n=1}^{\infty} a_n = L$, then $\lim_{n\to\infty} a_n = L$.

III. If $\lim_{n\to\infty} a_n = 0$, then $\sum_{n=1}^{\infty} a_n$ converges.

IV. If $\lim_{N\to\infty} S_N = L$, then $\sum_{n=1}^{\infty} a_n = L$.

V. If $\int_1^{\infty} f(x)dx = L$, then $\sum_{n=1}^{\infty} a_n = L$.

A) III and IV.

B) II, III, IV.

C) III, IV, V.

D) I and IV.

E) All of them.

A)

B)

C)

نقطتان (2) *

The integral that gives the volume when the region enclosed by $y = \ln(x)$, $x = e^3$ and $y = 0$ is revolved about the x-axis. (Use cylindrical shell method).

(A) $2\pi \int_0^{e^3} y(e^3 - e^y)\, dy$

(B) $2\pi \int_0^{3} ye^y\, dy$

(C) $2\pi \int_0^{3} y(e^3 - e^y)\, dy$

(D) $2\pi \int_0^{e^3} x\ln(x)\, dx$

(E) $2\pi \int_0^{3} (e^3 - e^y)\, dy$

A

B

C

D

E

نقطتان (2) *

The integral for the area of the surface obtained by rotating the curve $y^2 = x$, $0 < x < 3$, $y > 0$ about the x-axis is:

$$\sum_{n=1}^{\infty}\left(e^{\frac{2}{n}} - e^{\frac{2}{n+1}}\right) =$$

(A) $e^1 - 1$

(B) $e^2 - 1$

(C) $e^3 - 1$

(D) $e^4 - 1$

(E) $e^5 - 1$

A ○

B ○

C ○

D ○

E ○

*

نقطتان (2)

The integral that finds the volume obtained by rotating the region enclosed by $y = x^2$ and $y = 8 - x^2$ about the line $x = 5$

(A) $2\pi \int_{-2}^{2} (5 - x)(8 - 2x^2)\, dx$

(B) $2\pi \int_{-2}^{2} (5 + x)(8 - 2x^2)\, dx$

(C) $2\pi \int_{-\sqrt{8}}^{\sqrt{8}} (5 - x)(8 - x^2)\, dx$

(D) $2\pi \int_{-2}^{2} (8 - 2x^2)\, dx$

(E) $2\pi \int_{-2}^{2} (5 - x)(8 + 2x^2)\, dx$

A

B

C

D

E

الأسئلة

* نقطتان (2)

The limit of the sequence $a_n = \sqrt{\frac{2n^2}{8n^2+1}}$ is

A) $\frac{2}{3}$

B) $\frac{1}{4}$

C) $\frac{1}{2}$

D) $\frac{1}{8}$

E) $e^{\frac{1}{2}}$

- A ○
- B ○
- C ○
- D ○
- E ◉

نقطتان (2)

*

Use the slicing method to find the volume of the solid whose base is the region inside the circle $x^2 + y^2 = 1$ if the cross sections taken perpendicular to the y–axis are squares

(A) $\frac{16}{3}$ (B) $\frac{16}{3}\pi$

(C) $\frac{8}{3}\pi$ (D) $\frac{8}{3}$

(E) $\frac{4}{3}$

A

B

C

D

E

(2) نقطتان *

The arc length of $y = 5 + \frac{x^3}{6} + \frac{1}{2x}$ from $x = 1$ to $x = 4$ is

(A) $\int_1^4 \sqrt{1 + (5 + \frac{x^3}{6} + \frac{1}{2x})^2}\, dx$

(B) $\int_1^4 \sqrt{1 - (\frac{x^2}{2} + \frac{1}{2x^2})^2}\, dx$

(C) $\int_1^4 \sqrt{1 + \frac{x^2}{2} - \frac{1}{2x^2}}\, dx$

(D) $\int_1^4 (\frac{x^2}{2} - \frac{1}{2x^2})\, dx$

(E) $\int_1^4 (\frac{x^2}{2} + \frac{1}{2x^2})\, dx$

- A ○
- B ◉
- C ○
- D ○
- E ○

E ○

نقطتان (2) *

$$\sum_{n=1}^{\infty} \frac{1+3^n}{7^n} =$$

(A) $\frac{17}{30}$

(B) $\frac{22}{24}$

(C) $\frac{27}{18}$

(D) $\frac{32}{12}$

(E) $\frac{37}{6}$

A ○

B ◉

C ○

نقطتان (2) *

The integral for the area of the surface obtained by rotating the curve $y^2 = x,\ 0 \le x \le 3,\ \ y \ge 0$ about the x-axis is:

(a) $\int_0^3 \pi\sqrt{4x+1}dx$

(b) $\int_0^3 \pi\sqrt{4x+5}dx$

(c) $\int_0^3 \pi\sqrt{4x+9}dx$

(d) $\int_0^3 \pi\sqrt{4x+13}dx$

(e) $\int_0^3 \pi\sqrt{4x+17}dx$

- (•) A
- ( ) B
- ( ) C
- ( ) D
- ( ) E

نقطتان (2) *

نقطتان (2)

*

Use the slicing method to find the volume of the solid whose base is the region bounded by the lines $x + 5y = 5, x = 0$ and $y = 0$ if the cross sections taken perpendicular to the $x-$axis are semicircles

(A) $\frac{5}{6}$ (B) $\frac{5}{24}\pi$

(C) $\frac{5}{24}$ (D) $\frac{5}{6}\pi$

(E) $\frac{5}{3}\pi$

A

B

C

D

E

نقطتان (2) *

If the region enclosed by the $y-$axis, the line $y = 2$, and the curve $y = \sqrt{x}$ is revolved about the $y-$axis, the volume of the solid generated is

(A) π (B) $\frac{16\pi}{3}$

(C) $\frac{16\pi}{5}$ (D) $\frac{8\pi}{3}$

(E) $\frac{32\pi}{5}$

A

B

C

D

E

نقطتان (2) *