



Review Test Submission: Final Exam

Course	MAT251: General Calculus II
Test	Final Exam
Status	Completed
Score	262.5 out of 300 points
Time Elapsed	1 hour, 18 minutes out of 2 hours.
Instructions	

Question 1

7.5 out of 7.5 points

If a projectile is shot into the air with angle of elevation θ and initial velocity v_0 , the position vector of the projectile is given by:

Selected Answer:



Question 2

7.5 out of 7.5 points

The Absolute Value Theorem states that for a sequence $\{a_n\}$,

Selected Answer:



Question 3

7.5 out of 7.5 points

Consider the sequence

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

Which of the following are true for this sequence?

$\{a_n\}$ is bounded.

Selected Answer:



Question 4

7.5 out of 7.5 points

Find the area of the region bounded by the curve $r = 2 - 2 \sin \theta$.

Round your answer to three decimal places.

Selected Answer:



Question 5

7.5 out of 7.5 points
OK

Decide whether each of the following are properties of integrals.

$$\int [f(x) - g(x)] dx = \int f(x) dx - \int g(x) dx$$

Selected Answer:

Question 6

7.5 out of 7.5 points

Decide whether each of the following are properties of integrals.

$$\int [f(x) \cdot g(x)] dx = \int f(x) dx \cdot \int g(x) dx$$

Selected Answer:

Question 7

0 out of 7.5 points

A cylindrical tank of height 8 m and radius 3 m is filled half-way with water.

Approximately how much work is needed to pump the water to the rim of the tank?

Selected Answer:

Question 8

7.5 out of 7.5 points

Find the general antiderivative of $f(x) = \cos^2 2x$.

Selected Answer:

Question 9

7.5 out of 7.5 points

Given $a_n = f(n)$, we can use the Integral Test to determine whether $\sum_{n=1}^{\infty} a_n$ is convergent if

Selected Answer:

Question 10

7.5 out of 7.5 points

Given that $a_n > 0$ and $b_n > 0$ for all n , and that $\lim_{n \rightarrow \infty} \frac{a_n}{b_n} = L$, where $L \neq 0$ and $L \neq \infty$.

Decide whether each of the following are possible according to the Limit Comparison

Test.

$\sum_{n=1}^{\infty} a_n$ diverges and $\sum_{n=1}^{\infty} b_n$ converges.

Selected Answer:

Question 11

7.5 out of 7.5 points

Match each integral on the left with its solution on the right.

Question

Selected Match

$$\int \frac{dx}{(1-x^2)^{\frac{1}{2}}}$$



$$\int \frac{dx}{x(x^2-1)^{\frac{1}{2}}} \quad \blacksquare \quad \blacksquare$$

$$\int \frac{dx}{1+x^2} \quad \blacksquare \quad \blacksquare$$

Question 12

7.5 out of 7.5 points

Which of the following is a solution of the differential equation $\frac{dy}{dx} = 6x$?

Selected Answer: **Question 13**

7.5 out of 7.5 points

$$\int \frac{3}{4x^2-9} dx =$$

Selected Answer: **Question 14**

7.5 out of 7.5 points

Which of the following represents the area between the curves $f(x) = -x^2 + 2x + 3$ and $g(x) = x + 1$ on the interval $[-1, 2]$?

Selected Answer: **Question 15**

7.5 out of 7.5 points

Suppose we have a rod that is 6 meters long, with density function $\rho(x) = 2x + 3$.

What is the center of mass of the rod?

Selected Answer: **Question 16**

7.5 out of 7.5 points

Particles A and B are located on the x -axis . The masses and positions of the particles are given by:

$$m_A = 12 \text{ grams} \qquad x_A = 2$$

$$m_B = 8 \text{ grams} \qquad x_B = 10$$

What is the center of mass of this two particle system?

Selected Answer: **Question 17**

7.5 out of 7.5 points

Find the arc length of the curve $y = x^{\frac{3}{2}}$ from $x = 1$ to $x = 4$.

Round your answer to three decimal places.

Selected Answer:

Question 18

7.5 out of 7.5 points

If $f(x)$ is an even function, decide whether each of the following are true or false.

$$\int_{-a}^0 f(x) dx = \int_0^a f(x) dx$$

Selected Answer:

Question 19

7.5 out of 7.5 points

If $g(x) = \int_1^{\sqrt{x}} \frac{\sin t}{2t} dt$, then $g'(x) =$

Selected Answer:

Question 20

7.5 out of 7.5 points

If $g(x) = \int_1^{\sqrt{x}} \frac{\sin t}{2t} dt$, then $g'(x) =$

Selected Answer:

Question 21

0 out of 7.5 points

If $f(x)$ is an even function, decide whether each of the following are true or false.

$$\int_{-\infty}^{\infty} f(x) dx = 0$$

Selected Answer:

Question 22

7.5 out of 7.5 points

If an object is displaced a distance d by a constant force F , then the amount of work done is given by the equation:

Selected Answer:

Question 23

0 out of 7.5 points

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

Selected Answer: ()

Question 24

7.5 out of 7.5 points

The area of the region inside the polar curve $r = 4 \sin \theta$ and outside the polar curve $r = 2$ is given by

Selected Answer: **Question 25**

7.5 out of 7.5 points

For what values of x does $\sum_{n=1}^{\infty} \frac{(x+2)^n}{n3^n \sqrt{n}}$ converge?

Selected Answer: **Question 26**


7.5 out of 7.5 points

$$\sum_{n=1}^{\infty} \left(\frac{2}{3}\right)^n =$$

Selected Answer: **Question 27**


7.5 out of 7.5 points

The Maclaurin series for a function $f(x)$ is

Selected Answer: **Question 28**

7.5 out of 7.5 points

The net change in $y = f(x)$, as x changes from a to b , is given by:

Selected Answer: **Question 29**


7.5 out of 7.5 points

Which of the following differential equations is NOT separable?

Selected Answer: **Question 30**

7.5 out of 7.5 points

Given a curve defined parametrically from $t = a$ to $t = b$, the area of the surface generated when the curve is rotated about the x -axis is given by:

Selected Answer: **Question 31**

7.5 out of 7.5 points

If K is the maximum population that an environment can sustain, then the logistic equation modeling the population growth is given by:

Selected Answer: 

Question 32

7.5 out of 7.5 points

Match each of the integrals on the left with the corresponding solution on the right.

Question Selected Match

$$\int \sec x dx \quad \blacksquare \quad \blacksquare$$

$$\int \csc x dx \quad \blacksquare \quad \blacksquare$$

$$\int \cot x dx \quad \blacksquare \quad \blacksquare$$

Question 33

7.5 out of 7.5 points

A series of the form $a + ar + ar^2 + \dots + ar^{n-1} + \dots$ is called a _____ series.Selected Answer:

Question 34

7.5 out of 7.5 points

Decide whether each of the following integrals are improper.

$$\int_0^1 \frac{1}{e^x - 1} dx$$

Selected Answer:

Question 35

7.5 out of 7.5 points

Which of the following is true for any constant $a > 0$?Selected Answer:

Question 36

0 out of 7.5 points

Given the differential equation $\frac{dy}{dx} = x + y$ and initial point $(0, 0)$, use Euler's method withstep size $\Delta x = 0.5$ to approximate the coordinates of the next three points. $(x_1, y_1) =$ Selected Answer:

Question 37

7.5 out of 7.5 points

Which of the following is an antiderivative of $f(x) = 5^{2x}$?Selected Answer:

Question 38

7.5 out of 7.5 points

Which of the following gives the volume of the solid created by revolving a curve $f(x)$ around the y -axis?Selected Answer:

Question 39

7.5 out of 7.5
points

$$\int x e^{-2x} dx =$$

Selected Answer:



Question 40

0 out of 7.5 points

For which of the following series is the Ratio Test inconclusive (that is, it fails to give a definite answer)?

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

II.
$$\sum_{n=1}^{\infty} \frac{1}{n^4}$$

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

Selected Answer:

