



Review Test Submission: Midterm Exam

Course	MAT251: General Calculus II
Test	Midterm Exam
Status	Completed
Score	181.25 out of 250 points
Time Elapsed	50 minutes out of 2 hours.
Instructions	

Question 1

6.25 out of 6.25 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 2

6.25 out of 6.25 points

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

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

Selected Answer:

Question 3

6.25 out of 6.25 points

Decide whether each of the following are properties of the definite integral.

$$\int_a^a f(x) dx \text{ does not exist.}$$

Selected Answer:

Question 4

6.25 out of 6.25 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 5

6.25 out of 6.25 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?

OK

Selected Answer: **Question 6**

6.25 out of 6.25 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 7**

0 out of 6.25 points

Decide whether each of the following satisfies the differential equation $\frac{d^2y}{dx^2} - 9y = 0$.

$y = e^{-3x}$

Selected Answer: **Question 8**

0 out of 6.25 points

Given the differential equation $\frac{dy}{dx} = x + y$ and initial point $(0, 0)$, use Euler's method with

step size $\Delta x = 0.5$ to approximate the coordinates of the next three points.

$(x_1, y_1) =$

Selected Answer: **Question 9**

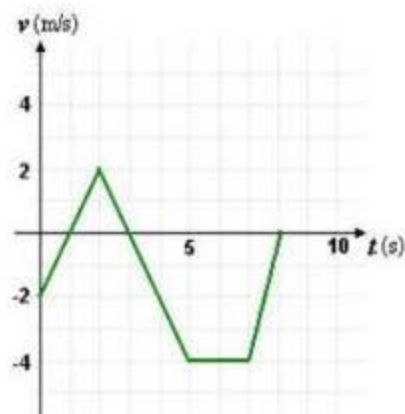
0 out of 6.25 points

Euler's method never gives exact solutions.

Selected Answer: **Question 10**

0 out of 6.25 points

The graph below shows the velocity of an object moving along the coordinate line.



What is the total distance traveled by the object?

Selected Answer: **Question 11**

0 out of 6.25 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 12

6.25 out of 6.25 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 13

6.25 out of 6.25 points

Decide whether each of the following are properties of integrals.

$$\int x^n dx = (n+1)x^{n+1} + C$$

Selected Answer:

Question 14

6.25 out of 6.25 points

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

Selected Answer:

Question 15

6.25 out of 6.25 points

$$\int \sec x dx =$$

Selected Answer:

Question 16

6.25 out of 6.25 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 17

0 out of 6.25 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 18

6.25 out of 6.25 points

Given a curve defined by the parametric equations:

$$x = 2t + 1$$

$$y = t^4$$

The length of the arc from $t = 2$ to $t = 4$ is given by:

Selected Answer: **Question 19**

6.25 out of 6.25 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:
$$\int_a^b 2\pi y \sqrt{\left(\frac{dx}{dt}\right)^2 + \left(\frac{dy}{dt}\right)^2} dt$$

Question 20

0 out of 6.25 points


Find the volume of the solid obtained by rotating the area bounded by $y = \sin x$ and the x -axis on the interval $0 \leq x \leq 2\pi$ about the x -axis .

Round your answer to the nearest thousandth.

Selected Answer: **Question 21**

6.25 out of 6.25 points

A solid of _____ is created by rotating a curve around the x -axis or y -axis .

Selected Answer: **Question 22**

6.25 out of 6.25 points

Suppose that 120 deer are placed in a protected region. If the region can support a maximum deer population of 500, then the bounded growth model for the deer population gives us the differential equation:

Selected Answer: **Question 23**

6.25 out of 6.25 points

Decide which trigonometric substitution on the right could be used to evaluate each of the integrals on the left.

Question Selected Match

$$\int \frac{dx}{\sqrt{a^2 + x^2}}$$

A. $x = a \tan \theta$

$$\int \frac{dx}{\sqrt{a^2 - x^2}}$$

C. $x = a \sin \theta$

$$\int \frac{dx}{\sqrt{x^2 - a^2}}$$

B. $x = a \sec \theta$ **Question 24**

6.25 out of 6.25 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 25**

6.25 out of 6.25 points

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

Selected Answer: **Question 26**

6.25 out of 6.25 points

Which of the following is the formula for integration by parts?

Selected Answer: **Question 27**

6.25 out of 6.25 points

$$\int_0^{\infty} \sin x \, dx \text{ converges.}$$

Selected Answer: **Question 28**

6.25 out of 6.25 points

Which of the following is true for any constant $a > 0$?Selected Answer: **Question 29**

6.25 out of 6.25 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 30**

0 out of 6.25 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 31**

0 out of 6.25 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**

0 out of 6.25 points

If the total population of a region is T , and if N people in this region are infected with a disease, then the logistic equation modeling the spread of the disease is:

Selected Answer:

Question 33

6.25 out of 6.25 points

$$\int \frac{t}{\sqrt{2t^2 - 1}} dt =$$

Selected Answer:

Question 34

6.25 out of 6.25 points

$$\int \frac{dy}{\sqrt{4 - y^2}} =$$

Selected Answer:

Question 35

6.25 out of 6.25 points

Which of the following integrals diverges?

Selected Answer:

Question 36

6.25 out of 6.25 points

$$\int x \cos x dx =$$

Selected Answer:

Question 37

0 out of 6.25 points

The base of a solid is a circle of radius 9 and every plane cross section perpendicular to the diameter is a square. The solid has volume

Selected Answer:

Question 38

6.25 out of 6.25 points

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

Selected Answer:

Question 39

6.25 out of 6.25 points

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

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

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

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

Selected Answer:

Question 40

6.25 out of 6.25
points

Find A and B such that

$$\frac{11x+2}{(x+1)(x-2)} = \frac{A}{x+1} + \frac{B}{x-2}$$

$A =$

Selected Answer: