Review Test Submission: Graded Exam - Unit 6

Course	MAT251: General Calculus II
Test	Graded Exam - Unit 6
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Status	Completed
Score	90 out of 150 points
Time Elapsed	53 minutes out of 1 hour.
Instructions	

Question 1

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 2

7.5 out of 7.5 points

A tank is formed by revolving the graph of $y = x^4$ around the y-axis. The tank has a height of 16. Find the value of m such that the line $y = m$ represents the height at which the tank is half full. Round your answer to three decimal places.

Selected Answer: ▮▮▮

Question 3

7.5 out of 7.5 points

Given the differential equation $\frac{dy}{dx} = f(x, y)$ and initial condition $y(x_0) = y_0$, Euler's method uses the following equation to approximate successive points on the solution curve:

Selected Answer: ▮▮▮▮▮▮

Question 4

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: ▮▮

OK

Question 5

<div style="float:right">7.5 out of 7.5 points</div>

An object is moving along the coordinate line with velocity $v(t) = 5\cos t$, $0 \le t \le 2\pi$. What is the object's displacement during the interval from $t = 0$ to $t = 2\pi$?

Selected Answer: ■

Question 6

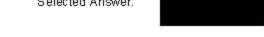<div style="float:right">7.5 out of 7.5 points</div>

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 7

<div style="float:right">7.5 out of 7.5 points</div>

Which of the following integrals represents the area of the surface formed by revolving the graph of $f(x) = x^2$, $0 \le x \le 1$, about the y-axis ?

Selected Answer: ▬▬▬

Question 8

<div style="float:right">0 out of 7.5 points</div>

Find the general solution of $\int (2\vec{i} - e^{3t}\vec{j})\,dt$.

Selected Answer: ▬▬▬

Question 9

<div style="float:right">7.5 out of 7.5 points</div>

Suppose that a force of 20 N stretches a spring 0.4 m beyond its natural length.

How far will a 40 N force stretch the spring?

Selected Answer: ■

Question 10

<div style="float:right">0 out of 7.5 points</div>

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

Round your answer to the nearest thousandth.

Selected Answer: ▬▬

Question 11

<div style="float:right">0 out of 7.5 points</div>

Given the differential equation $\dfrac{dy}{dx} = x + y$ 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.
$(x_3, y_3) =$

Selected Answer: ▬ ▬

Question 12

7.5 out of 7.5 points

Suppose that $f(x)$ is the probability density function describing the distribution for the number of minutes it takes to solve a puzzle.

Which of the following represents the probability that you will solve the puzzle in 8-10 minutes?

Selected Answer: ███████

Question 13

0 out of 7.5 points

Find the length of the arc:

$$x = 3\cos t + 1, \quad y = 3\sin t - 5, \quad 0 \le t \le \pi$$
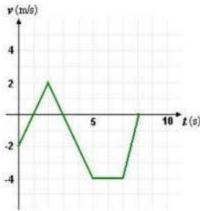
Round your answer to three decimal places.

Selected Answer: ████

Question 14

0 out of 7.5 points

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

What is the object's displacement?

Selected Answer: ██

Question 15

7.5 out of 7.5 points

A projectile is shot into the air with inital speed $v_0 = 40$ and angle of elevation $\theta = \dfrac{\pi}{6}$.

What is the position of the projectile at $t = 3$?

Selected Answer: █████████

Question 16

0 out of 7.5 points

Which of the following differential equations is NOT separable?

Selected Answer: ██████

Question 17

0 out of 7.5 points

A solid has a flat base, which is bounded by the graph of $y = x^3$ and $y = \sqrt{x}$ in the first quadrant only. Each cross section of the solid perpendicular to the x-axis is the shape of a square. Find the value of k on the interval $\left(0, \frac{1}{2}\right)$ such that the line $x = k$ cuts off one third of the solid's volume. Round your answer to three decimal places.

Selected Answer: ██████ ██████

Question 18

0 out of 7.5 points

Given a curve defined by the parametric equations:

$$x = t^2$$

$$y = 3t$$

The area under the curve from $t = 0$ to $t = 3$ is given by:

Selected Answer: ██████

Question 19

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 20

7.5 out of 7.5 points

Given the cost function $C(x)$, the marginal cost is given by:

Selected Answer: ██████

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