Quiz 6

Graded

Student

Ivan Wang

Total Points

22 / 25 pts

Question 1

Displacement

5 / 5 pts

✔ **– 0 pts** Correct.

1. Sets up definite integral with correct limits of integration and integrand is the given velocity function.
2. Correctly evaluates definite integral
3. Provides correct units in answer

Question 2

Substitution Rule: Indefinite integral

9 / 9 pts

✔ **– 0 pts** Correct

Question 3

Substitution Rule: Definite integral

8 / 11 pts

Calculation of transformed integral: No need to simplify final answer

✔ **– 3 pts** Using an antiderivative $F(x)$ of the given integrand with respect to x, applies FTC 2 using u-limits of integration: $F(u(1)) - F(u(0))$

Quiz 6: MTH 141- TR
Worth: 25 points
Time Limit: 25 Minutes

Name: Ivan Wang

Student ID:

5	0	4	1	4	3	2	1

Authorized item(s): None. This is a closed-note, closed-book quiz. Calculators are not allowed.

This quiz has 3 questions. The backside of each page of this quiz will not be graded.

1. (5 points) The velocity of an object moving along a straight path is $v(t) = 2 - t$ inches/second for $0 \leq t \leq 6$ (seconds). Use the Net Change Theorem to find the displacement of the object over the interval $0 \leq t \leq 6$. Include units.

$v(t) = 2 - t = 0$

$t = 2$

$\int (2 - t)\,dt \Rightarrow \int \left(2t - \frac{t^2}{2}\right) dt$

$\int_0^2 \left(2t - \frac{t^2}{2}\right) + \int_2^6 \left(2t - \frac{t^2}{2}\right)$

$\left(2(6) - \frac{6^2}{2}\right) - \left(2(0) - \frac{0^2}{2}\right)$

$12 - \frac{36}{2} - 0$

$12 - 18 = -6$

-6 inches

2. (9 points) Use the Substitution Rule to calculate the indefinite integral: $\int x^3 e^{x^4+2}\,dx$

$\int x^3 e^{x^4+2}\,dx$

substitution

$u = x^4 + 2$

$du = 4x^3\,dx$

$\frac{1}{4}du = x^3\,dx$

$\int e^u \cdot \frac{1}{4}\,du$

$\frac{1}{4}\int e^u \cdot du$

$\frac{1}{4}e^u + C \Rightarrow \frac{1}{4}e^{x^4+2} + C$

Name: Ivan Wang **Student ID:** 5 0 4 1 4 3 2 1

3. (11 points) Use the Substitution Rule to evaluate the definite integral. There is no need to simplify your final answer.

$$\int_0^1 2x^2\sqrt{x^3+5}\,dx$$

$\int_0^1 2x^2\sqrt{x^3+5}\,dx$

Substitution

$u = x^3+5$

$du = 3x^2\,dx$

$\frac{1}{3}du = x^2\,dx$

$\int_0^1 \sqrt{u}\cdot 2\left(\frac{1}{3}du\right)$

$\frac{2}{3}\int_{u(0)=5}^{u(1)=6} u^{1/2}\,du$

$\frac{2}{3}\int_5^6 u^{1/2}\Big]_5^6 \Rightarrow \frac{2}{3}\int_5^6 \frac{2}{3}u^{3/2}\Big]_5^6$

$\frac{2}{3}\left(\frac{2}{3}(6^3+5)^{3/2} - \frac{2}{3}(5^3+5)^{3/2}\right)$