

Quiz 12

● Graded

Student

Colin Cano

Total Points

10 / 10 pts

Question 1

Q1

3 / 3 pts

✓ - 0 pts Correct: $\frac{1}{4} \ln |x^4 - 5| + C$

detailed options

- 0.5 pts Didn't $+C$ after finding antiderivative from a previous step
- 0.5 pts Didn't substitute the variable back to x from a previous step, e.g., $\frac{1}{4} \ln |u| + C$
- 0.5 pts Didn't get correct antiderivative from a previous step, e.g., didn't have absolute value sign in \ln .
- 0.5 pts Didn't rewrite as $\frac{1}{x^4-5} = \frac{1}{u}$
- 0.5 pts Didn't get $\frac{1}{4} du = x^3 dx$

- 2.5 pts Attempted to do the problem.

- 3 pts No work

Great!

Question 2

Q2

3.5 / 3.5 pts

✓ - 0 pts Correct: $\frac{2}{5}(z+1)^{\frac{5}{2}} - \frac{2}{3}(z+1)^{\frac{3}{2}} + C$

Select all that apply:

- 0.5 pts Didn't $+C$ after finding antiderivative.
- 0.5 pts Didn't substitute/Incorrectly substituted the variable back to z from a previous step
- 0.5 pts Made one type of mistakes in finding antiderivative from a previous step, e.g., didn't divide by their new power, didn't $+1$ to get the new power, or flipped the negative sign to positive.
- 1 pt Didn't find the antiderivative or made more than one type of mistakes in finding antiderivative from a previous step, e.g., didn't divide by their new power, didn't $+1$ to get the new power, or flipped the negative sign to positive.
- 0.5 pts Made mistakes in rewriting/simplifying the integration function from a previous step e.g., $z\sqrt{z+1} = (u+1)\sqrt{u}$, or missed the parentheses for $u-1$.
- 0.5 pts Used a substitution different from $u = z+1$

- 3 pts Attempted to do the problem

- 3.5 pts No work

Great!

Question 3

Q3

3.5 / 3.5 pts

✓ - 0 pts Correct: $\frac{e-1}{2}$

detailed options

- 0.5 pts Algebraic mistake in final answer, e.g., having $e^0 = 0$.
 - 0.5 pts Did the subtraction the other way around between the evaluation of the antiderivative at upper and lower boundaries
 - 1 pt Didn't evaluate the antiderivative at the upper nor the lower boundary.
 - 0.5 pts Got an incorrect antiderivative from a previous step
 - 0.5 pts Incorrectly rewrote the integral in u from a previous step
 - 0.5 pts Didn't have $du = 2t dt$ or a correct relation between du and dt from a previous step.
 - 0.5 pts Used a substitution different from $u = t^2$
-
- 3 pts Attempted to do the problem
 - 3.5 pts No work

Great!

Name: Colin Cano

Student ID: _____

1. Find the following indefinite integral by making the given substitution.

$$\int \frac{x^3}{x^4 - 5} dx, \quad u = x^4 - 5 \quad \frac{du}{dx} = 4x^3 \quad dx = \frac{1}{4} du$$

$$\int \frac{1}{u} \cdot \frac{1}{4} du = \frac{1}{4} \int \frac{1}{u} du = \frac{1}{4} (\ln|u|) + C = \boxed{\frac{1}{4} (\ln|x^4 - 5|) + C}$$

2. Evaluate the following indefinite integral.

$$u = z+1 \quad du = dz$$

$$\int z\sqrt{z+1} dz = \int \sqrt{u}(u-1) du = \int u^{3/2} - u^{1/2} du =$$

$$\frac{2}{5} u^{5/2} - \frac{2}{3} u^{3/2} = \boxed{\frac{2}{5} (z+1)^{5/2} - \frac{2}{3} (z+1)^{3/2} + C}$$

3. Evaluate the following definite integral.

$$u = t^2 \quad \frac{du}{dt} = 2t \quad dt = \frac{1}{2} \frac{du}{t}$$

$$\int_0^1 t e^{t^2} dt = \int e^u \frac{du}{2} = \frac{1}{2} \int e^u du = \frac{1}{2} e^u + C$$

$$= \frac{1}{2} e^{t^2} \Big|_0^1 = \frac{1}{2} e^1 - \frac{1}{2} e^0 = \boxed{\frac{e}{2} - \frac{1}{2}}$$

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