1. Question Details

Transform this antiderivative problem using the substitution \( u = 5x + 1 \).

\[
\int \frac{2x}{5x + 1} \, dx
\]

NOTE: You will have to work harder in the substitution phase. Click here for details.

Your final answer should be a new antiderivative problem written in terms of the variable \( u \).

\[
\int \, dx
\]

Solve the original problem. Write your answer in terms of \( x \) and include \( +C \)

\[
\int \frac{2x}{5x + 1} \, dx =
\]

2. Question Details

Transform this integral using the substitution \( u = 7x + 2 \).

\[
\int_{0}^{8} \frac{x}{7x + 2} \, dx
\]

Your final answer should be a new integral written in terms of \( u \):

\[
\int_{a}^{b} \, dx
\]

in which

\[
a = \quad \text{and} \quad b =
\]

Compute the new integral. Write your answer in exact (but unsimplified) form. Do not use decimals.

3. Question Details

Transform the antiderivative problem

\[
\int \cot x \, dx
\]

using the substitution \( u = \sin x \). Your final answer should be a new antiderivative problem written in terms of \( u \).

\[
\int \, dx
\]

Then solve the antiderivative problem. Your answer must be written in terms of \( x \) and should include \( +C \)

\[
\int \cot x \, dx =
\]
4. **Question Details**

Transform this integral using the substitution \( u = \cos x \).

\[
\int_{\pi/4}^{\sqrt{3}/3} \tan x \, dx
\]

Your final answer should be a new integral written in terms of \( u \):

\[
\int_a^b \]

in which

\( a = \) and \( b = \)

Compute the new integral. Write your answer in exact (but unsimplified) form. Do not use decimals.

5. **Question Details**

Transform the antiderivative problem

\[
\int \sec x \, dx
\]

using the substitution \( u = \sec x + \tan x \). Your final answer should be a new antiderivative problem written in terms of \( u \).

\[
\int \sec x \, dx =
\]

Then solve the antiderivative problem. Your answer must be written in terms of \( x \) and should include \(+C\)