Calculus Practice: Techniques for Finding Antiderivatives 7a

Evaluate each indefinite integral. Use the provided substitution.

1) $\int e^{4x} \cdot -16e^{e^{4x}-2}\,dx;\ u = e^{4x} - 2$

A) $2^{e^{4x}-2} + C$
B) $-4\ln\left|e^{4x} - 2\right| + C$
C) $-4e^{e^{4x}-2} + C$
D) $-\frac{4 \cdot 2^{e^{4x}-2}}{\ln 2} + C$

2) $\int e^{5x} \cdot 10e^{e^{5x}+4}\,dx;\ u = e^{5x} + 4$

A) $\ln\left|e^{5x} + 4\right| + C$
B) $2e^{e^{5x}+4} + C$
C) $\frac{2 \cdot 4^{e^{5x}+4}}{\ln 4} + C$
D) $e^{e^{5x}+4} + C$

3) $\int -\frac{5e^{5x}}{e^{5x}+4}\,dx;\ u = e^{5x} + 4$

A) $-\frac{5^{e^{5x}+4}}{\ln 5} + C$
B) $-\ln\left(e^{5x} + 4\right) + C$
C) $\ln\left|e^{5x} + 4\right| + C$
D) $-e^{e^{5x}+4} + C$

4) $\int e^{4x} \cdot 4e^{e^{4x}-5}\,dx;\ u = e^{4x} - 5$

A) $2^{e^{4x}-5} + C$
B) $2e^{e^{4x}-5} + C$
C) $e^{e^{4x}-5} + C$
D) $\frac{2^{e^{4x}-5}}{\ln 2} + C$

5) $\int -\frac{3e^{3x}}{e^{3x}+4}\,dx;\ u = e^{3x} + 4$

A) $-\ln\left(e^{3x} + 4\right) + C$
B) $-\ln\left|e^{3x} + 4\right| + C$
C) $-e^{e^{3x}+4} + C$
D) $\ln\left|e^{3x} + 4\right| + C$

6) $\int e^{2x} \cdot 2 \cdot 4^{e^{2x}+1}\,dx;\ u = e^{2x} + 1$

A) $2e^{e^{2x}+1} + C$
B) $\frac{4^{e^{2x}+1}}{\ln 4} + C$
C) $e^{e^{2x}+1} + C$
D) $2\ln\left|e^{2x} + 1\right| + C$

7) $\int -\frac{3e^{x}}{e^{x}+2}\,dx;\ u = e^{x} + 2$

A) $\ln\left|e^{x} + 2\right| + C$
B) $-3e^{e^{x}+2} + C$
C) $-3\ln\left(e^{x} + 2\right) + C$
D) $-3\ln\left|e^{x} + 2\right| + C$

8) $\int e^{4x} \cdot -4e^{e^{4x}+4}\,dx;\ u = e^{4x} + 4$

A) $-e^{e^{4x}+4} + C$
B) $5^{e^{4x}+4} + C$
C) $-\frac{5^{e^{4x}+4}}{\ln 5} + C$
D) $e^{e^{4x}+4} + C$

9) $\int e^{4x} \cdot 12e^{e^{4x}-4}\,dx;\ u = e^{4x} - 4$

A) $3e^{e^{4x}-4} + C$
B) $e^{e^{4x}-4} + C$
C) $\frac{3 \cdot 2^{e^{4x}-4}}{\ln 2} + C$
D) $\ln\left|e^{4x} - 4\right| + C$

10) $\int e^{x} \cdot 2 \cdot 3^{e^{x}+5}\,dx;\ u = e^{x} + 5$

A) $e^{e^{x}+5} + C$
B) $2\ln\left|e^{x} + 5\right| + C$
C) $\frac{2 \cdot 3^{e^{x}+5}}{\ln 3} + C$
D) $\ln\left|e^{x} + 5\right| + C$

11) $\int e^{2x} \cdot -8 \cdot 3^{e^{2x}+4}\, dx;\ u = e^{2x} + 4$

A) $\ln \left|e^{2x} + 4\right| + C$
B) $-4\ln \left|e^{2x} + 4\right| + C$
C) $-\frac{4 \cdot 3^{e^{2x}+4}}{\ln 3} + C$
D) $-4e^{e^{2x}+4} + C$

12) $\int -\frac{2e^x}{e^x - 2}\, dx;\ u = e^x - 2$

A) $e^{e^x - 2} + C$
B) $3^{e^x - 2} + C$
C) $-\frac{2 \cdot 3^{e^x - 2}}{\ln 3} + C$
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13) $\int e^{5x} \cdot 10e^{e^{5x}-2}\, dx;\ u = e^{5x} - 2$

A) $4^{e^{5x}-2} + C$
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14) $\int \frac{4e^x}{e^x - 5}\, dx;\ u = e^x - 5$

A) $e^{e^x - 5} + C$
B) $4\ln \left|e^x - 5\right| + C$
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15) $\int \frac{2e^{2x}}{e^{2x} + 1}\, dx;\ u = e^{2x} + 1$

A) $e^{e^{2x}+1} + C$
B) $2\ln \left|e^{2x} + 1\right| + C$
C) $\ln \left(e^{2x} + 1\right) + C$
D) $2e^{e^{2x}+1} + C$

16) $\int e^x \cdot 4e^{e^x - 5}\, dx;\ u = e^x - 5$

A) $4\ln \left|e^x - 5\right| + C$
B) $e^{e^x - 5} + C$
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18) $\int -\frac{2e^x}{e^x - 3}\, dx;\ u = e^x - 3$

A) $4^{e^x - 3} + C$
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C) $e^{e^x - 3} + C$
D) $-\frac{2 \cdot 4^{e^x - 3}}{\ln 4} + C$

19) $\int e^{3x} \cdot -3e^{e^{3x}-3}\, dx;\ u = e^{3x} - 3$

A) $-e^{e^{3x}-3} + C$
B) $5^{e^{3x}-3} + C$
C) $-\ln \left|e^{3x} - 3\right| + C$
D) $-\frac{5^{e^{3x}-3}}{\ln 5} + C$

20) $\int e^{2x} \cdot 2 \cdot 5^{e^{2x}-3}\, dx;\ u = e^{2x} - 3$

A) $\frac{5^{e^{2x}-3}}{\ln 5} + C$
B) $e^{e^{2x}-3} + C$
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