Calculus Practice: Techniques for Finding Antiderivatives 11b

Evaluate each indefinite integral. Use the provided substitution.

1) $\int 6e^{3x} \cdot \csc^2\left(e^{3x} + 2\right)\, dx;\ u = e^{3x} + 2$

2) $\int -2e^{2x}\cos\left(e^{2x} + 3\right)\, dx;\ u = e^{2x} + 3$

3) $\int -15e^{3x} \cdot \csc^2\left(e^{3x} + 5\right)\, dx;\ u = e^{3x} + 5$

4) $\int -12e^{3x} \cdot \csc^2\left(e^{3x} + 2\right)\, dx;\ u = e^{3x} + 2$

5) $\int 20e^{4x}\cos\left(e^{4x} - 1\right)\, dx;\ u = e^{4x} - 1$

6) $\int 4e^{2x}\tan\left(e^{2x} - 5\right)\, dx;\ u = e^{2x} - 5$

7) $\int -10e^{2x}\csc\left(e^{2x} - 2\right)\, dx;\ u = e^{2x} - 2$

8) $\int 4e^{4x}\tan\left(e^{4x} + 5\right)\, dx;\ u = e^{4x} + 5$

9) $\int -e^{x}\cot\left(e^{x} - 2\right)\, dx;\ u = e^{x} - 2$

10) $\int 5e^{x}\sec\left(e^{x} - 5\right)\, dx;\ u = e^{x} - 5$

11) $\int \frac{2e^{x}}{\csc\left(e^{x}+3\right)}\,dx;\ u=e^{x}+3$

12) $\int \frac{8e^{4x}}{\csc\left(e^{4x}+2\right)}\,dx;\ u=e^{4x}+2$

13) $\int -\frac{e^{x}}{\sin^{2}\left(e^{x}-1\right)}\,dx;\ u=e^{x}-1$

14) $\int \frac{9e^{3x}\cos\left(e^{3x}+3\right)}{\sin^{2}\left(e^{3x}+3\right)}\,dx;\ u=e^{3x}+3$

15) $\int -\frac{8e^{2x}}{\sin^{2}\left(e^{2x}-3\right)}\,dx;\ u=e^{2x}-3$

16) $\int -\frac{4e^{4x}\cos\left(e^{4x}+5\right)}{\sin\left(e^{4x}+5\right)}\,dx;\ u=e^{4x}+5$

17) $\int -\frac{20e^{4x}\sin\left(e^{4x}-1\right)}{\cos\left(e^{4x}-1\right)}\,dx;\ u=e^{4x}-1$

18) $\int \frac{10e^{5x}}{\cos\left(e^{5x}-3\right)}\,dx;\ u=e^{5x}-3$

19) $\int \frac{12e^{4x}\sin\left(e^{4x}-5\right)}{\cos\left(e^{4x}-5\right)}\,dx;\ u=e^{4x}-5$

20) $\int -\frac{4e^{2x}}{\cos\left(e^{2x}+5\right)}\,dx;\ u=e^{2x}+5$

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Evaluate each indefinite integral. Use the provided substitution.

1) $\int 6e^{3x} \cdot \csc^2\left(e^{3x}+2\right)\,dx;\ u = e^{3x}+2$

$-2\cot\left(e^{3x}+2\right)+C$

2) $\int -2e^{2x}\cos\left(e^{2x}+3\right)\,dx;\ u = e^{2x}+3$

$-\sin\left(e^{2x}+3\right)+C$

3) $\int -15e^{3x} \cdot \csc^2\left(e^{3x}+5\right)\,dx;\ u = e^{3x}+5$

$5\cot\left(e^{3x}+5\right)+C$

4) $\int -12e^{3x} \cdot \csc^2\left(e^{3x}+2\right)\,dx;\ u = e^{3x}+2$

$4\cot\left(e^{3x}+2\right)+C$

5) $\int 20e^{4x}\cos\left(e^{4x}-1\right)\,dx;\ u = e^{4x}-1$

$5\sin\left(e^{4x}-1\right)+C$

6) $\int 4e^{2x}\tan\left(e^{2x}-5\right)\,dx;\ u = e^{2x}-5$

$2\ln\left|\sec\left(e^{2x}-5\right)\right|+C$

7) $\int -10e^{2x}\csc\left(e^{2x}-2\right)\,dx;\ u = e^{2x}-2$

$-5\ln\left|\csc\left(e^{2x}-2\right)-\cot\left(e^{2x}-2\right)\right|+C$

8) $\int 4e^{4x}\tan\left(e^{4x}+5\right)\,dx;\ u = e^{4x}+5$

$\ln\left|\sec\left(e^{4x}+5\right)\right|+C$

9) $\int -e^{x}\cot\left(e^{x}-2\right)\,dx;\ u = e^{x}-2$

$-\ln\left|\sin\left(e^{x}-2\right)\right|+C$

10) $\int 5e^{x}\sec\left(e^{x}-5\right)\,dx;\ u = e^{x}-5$

$5\ln\left|\sec\left(e^{x}-5\right)+\tan\left(e^{x}-5\right)\right|+C$

11) $\int \frac{2e^x}{\csc\left(e^x+3\right)}\,dx;\ u = e^x + 3$

$-2\cos\left(e^x+3\right)+C$

12) $\int \frac{8e^{4x}}{\csc\left(e^{4x}+2\right)}\,dx;\ u = e^{4x} + 2$

$-2\cos\left(e^{4x}+2\right)+C$

13) $\int -\frac{e^x}{\sin^2\left(e^x-1\right)}\,dx;\ u = e^x - 1$

$\cot\left(e^x-1\right)+C$

14) $\int \frac{9e^{3x}\cos\left(e^{3x}+3\right)}{\sin^2\left(e^{3x}+3\right)}\,dx;\ u = e^{3x} + 3$

$-3\csc\left(e^{3x}+3\right)+C$

15) $\int -\frac{8e^{2x}}{\sin^2\left(e^{2x}-3\right)}\,dx;\ u = e^{2x} - 3$

$4\cot\left(e^{2x}-3\right)+C$

16) $\int -\frac{4e^{4x}\cos\left(e^{4x}+5\right)}{\sin\left(e^{4x}+5\right)}\,dx;\ u = e^{4x} + 5$

$-\ln\left|\sin\left(e^{4x}+5\right)\right|+C$

17) $\int -\frac{20e^{4x}\sin\left(e^{4x}-1\right)}{\cos\left(e^{4x}-1\right)}\,dx;\ u = e^{4x} - 1$

$-5\ln\left|\sec\left(e^{4x}-1\right)\right|+C$

18) $\int \frac{10e^{5x}}{\cos\left(e^{5x}-3\right)}\,dx;\ u = e^{5x} - 3$

$2\ln\left|\sec\left(e^{5x}-3\right)+\tan\left(e^{5x}-3\right)\right|+C$

19) $\int \frac{12e^{4x}\sin\left(e^{4x}-5\right)}{\cos\left(e^{4x}-5\right)}\,dx;\ u = e^{4x} - 5$

$3\ln\left|\sec\left(e^{4x}-5\right)\right|+C$

20) $\int -\frac{4e^{2x}}{\cos\left(e^{2x}+5\right)}\,dx;\ u = e^{2x} + 5$

$-2\ln\left|\sec\left(e^{2x}+5\right)+\tan\left(e^{2x}+5\right)\right|+C$