Calculus Practice: Techniques for Finding Antiderivatives 3b

Evaluate each indefinite integral. Use the provided substitution.

1) $\int (e^{2r} - 1)^4 \cdot 8e^{2r}\, dr;\ u = e^{2r} - 1$

2) $\int (e^{5t} + 1)^3 \cdot 25e^{5t}\, dt;\ u = e^{5t} + 1$

3) $\int (e^{5s} - 4)^3 \cdot 10e^{5s}\, ds;\ u = e^{5s} - 4$

4) $\int 12e^{3s} \cdot (e^{3s} + 1)^3\, ds;\ u = e^{3s} + 1$

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

6) $\int (e^{5s} + 5)^5 \cdot 10e^{5s}\, ds;\ u = e^{5s} + 5$

7) $\int (e^{2t} - 3)^4 \cdot 10e^{2t}\, dt;\ u = e^{2t} - 3$

8) $\int 8e^{4t} \cdot (e^{4t} - 1)^4\, dt;\ u = e^{4t} - 1$

9) $\int \frac{4e^{2x}}{(e^{2x} + 1)^3}\, dx;\ u = e^{2x} + 1$

10) $\int \frac{10e^{2x}}{(e^{2x} - 2)^5}\, dx;\ u = e^{2x} - 2$

11) $\int \left(e^{5x}-1\right)^{-5} \cdot 10e^{5x}\, dx;\ u = e^{5x}-1$

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

13) $\int \frac{15e^{5x}}{\left(e^{5x}+4\right)^{4}}\, dx;\ u = e^{5x}+4$

14) $\int \frac{12e^{3x}}{\left(e^{3x}+5\right)^{5}}\, dx;\ u = e^{3x}+5$

15) $\int 25e^{5x}\sqrt[3]{e^{5x}+5}\, dx;\ u = e^{5x}+5$

16) $\int 25e^{5x} \cdot \left(e^{5x}-2\right)^{\frac{1}{2}}\, dx;\ u = e^{5x}-2$

17) $\int 15e^{5x}\sqrt[3]{e^{5x}-5}\, dx;\ u = e^{5x}-5$

18) $\int 8e^{4x}\sqrt{e^{4x}+2}\, dx;\ u = e^{4x}+2$

19) $\int 8e^{4x}\sqrt[3]{e^{4x}-2}\, dx;\ u = e^{4x}-2$

20) $\int 25e^{5x}\sqrt[3]{e^{5x}-4}\, dx;\ u = e^{5x}-4$

Calculus Practice: Techniques for Finding Antiderivatives 3b

Evaluate each indefinite integral. Use the provided substitution.

1) $\int (e^{2r} - 1)^4 \cdot 8e^{2r}\, dr;\ u = e^{2r} - 1$

$\frac{4}{5}(e^{2r} - 1)^5 + C$

2) $\int (e^{5t} + 1)^3 \cdot 25e^{5t}\, dt;\ u = e^{5t} + 1$

$\frac{5}{4}(e^{5t} + 1)^4 + C$

3) $\int (e^{5s} - 4)^3 \cdot 10e^{5s}\, ds;\ u = e^{5s} - 4$

$\frac{1}{2}(e^{5s} - 4)^4 + C$

4) $\int 12e^{3s} \cdot (e^{3s} + 1)^3\, ds;\ u = e^{3s} + 1$

$(e^{3s} + 1)^4 + C$

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

$\frac{2}{5}(e^{5x} - 5)^5 + C$

6) $\int (e^{5s} + 5)^5 \cdot 10e^{5s}\, ds;\ u = e^{5s} + 5$

$\frac{1}{3}(e^{5s} + 5)^6 + C$

7) $\int (e^{2t} - 3)^4 \cdot 10e^{2t}\, dt;\ u = e^{2t} - 3$

$(e^{2t} - 3)^5 + C$

8) $\int 8e^{4t} \cdot (e^{4t} - 1)^4\, dt;\ u = e^{4t} - 1$

$\frac{2}{5}(e^{4t} - 1)^5 + C$

9) $\int \frac{4e^{2x}}{(e^{2x} + 1)^3}\, dx;\ u = e^{2x} + 1$

$-\frac{1}{(e^{2x} + 1)^2} + C$

10) $\int \frac{10e^{2x}}{(e^{2x} - 2)^5}\, dx;\ u = e^{2x} - 2$

$-\frac{5}{4(e^{2x} - 2)^4} + C$

11) $\int (e^{5x} - 1)^{-5} \cdot 10e^{5x}\, dx;\ u = e^{5x} - 1$

$-\frac{1}{2(e^{5x} - 1)^4} + C$

12) $\int 20e^{4x} \cdot (e^{4x} + 2)^{-5}\, dx;\ u = e^{4x} + 2$

$-\frac{5}{4(e^{4x} + 2)^4} + C$

13) $\int \frac{15e^{5x}}{(e^{5x} + 4)^4}\, dx;\ u = e^{5x} + 4$

$-\frac{1}{(e^{5x} + 4)^3} + C$

14) $\int \frac{12e^{3x}}{(e^{3x} + 5)^5}\, dx;\ u = e^{3x} + 5$

$-\frac{1}{(e^{3x} + 5)^4} + C$

15) $\int 25e^{5x}\sqrt[3]{e^{5x} + 5}\, dx;\ u = e^{5x} + 5$

$\frac{15}{4}(e^{5x} + 5)^{\frac{4}{3}} + C$

16) $\int 25e^{5x} \cdot (e^{5x} - 2)^{\frac{1}{2}}\, dx;\ u = e^{5x} - 2$

$\frac{10}{3}(e^{5x} - 2)^{\frac{3}{2}} + C$

17) $\int 15e^{5x}\sqrt[3]{e^{5x} - 5}\, dx;\ u = e^{5x} - 5$

$\frac{9}{4}(e^{5x} - 5)^{\frac{4}{3}} + C$

18) $\int 8e^{4x}\sqrt{e^{4x} + 2}\, dx;\ u = e^{4x} + 2$

$\frac{4}{3}(e^{4x} + 2)^{\frac{3}{2}} + C$

19) $\int 8e^{4x}\sqrt[3]{e^{4x} - 2}\, dx;\ u = e^{4x} - 2$

$\frac{3}{2}(e^{4x} - 2)^{\frac{4}{3}} + C$

20) $\int 25e^{5x}\sqrt[3]{e^{5x} - 4}\, dx;\ u = e^{5x} - 4$

$\frac{15}{4}(e^{5x} - 4)^{\frac{4}{3}} + C$