Name_____

Integration by Substitution

Date_____ Period____

Evaluate each indefinite integral. Use the provided substitution.

1) $\displaystyle\int \frac{20x^4}{4x^5 + 3}\, dx; \ u = 4x^5 + 3$

2) $\displaystyle\int 36x^2 e^{4x^3 + 3}\, dx; \ u = 4x^3 + 3$

3) $\displaystyle\int 80x^3 \cdot 3^{5x^4 - 2}\, dx; \ u = 5x^4 - 2$

4) $\displaystyle\int \frac{2}{x(-1 + \ln 4x)}\, dx; \ u = -1 + \ln 4x$

Evaluate each indefinite integral.

5) $\displaystyle\int \frac{12x^2}{x^3 + 2}\, dx$

6) $\displaystyle\int \frac{20e^{5x}}{e^{5x} + 3}\, dx$

7) $\displaystyle\int 10\sin -2x \cdot e^{\cos -2x}\, dx$

8) $\displaystyle\int \frac{5e^{-3 + \ln 3x}}{x}\, dx$

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Evaluate each indefinite integral. Use the provided substitution.

1) $\displaystyle\int \frac{20x^4}{4x^5 + 3}\,dx;\ u = 4x^5 + 3$

$\ln\left|4x^5 + 3\right| + C$

2) $\displaystyle\int 36x^2 e^{4x^3 + 3}\,dx;\ u = 4x^3 + 3$

$3e^{4x^3 + 3} + C$

3) $\displaystyle\int 80x^3 \cdot 3^{5x^4 - 2}\,dx;\ u = 5x^4 - 2$

$\dfrac{4 \cdot 3^{5x^4 - 2}}{\ln 3} + C$

4) $\displaystyle\int \frac{2}{x(-1 + \ln 4x)}\,dx;\ u = -1 + \ln 4x$

$2\ln\left|-1 + \ln 4x\right| + C$

Evaluate each indefinite integral.

5) $\displaystyle\int \frac{12x^2}{x^3 + 2}\,dx$

$4\ln\left|2x^3 + 4\right| + C$

6) $\displaystyle\int \frac{20e^{5x}}{e^{5x} + 3}\,dx$

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

7) $\displaystyle\int 10\sin -2x \cdot e^{\cos -2x}\,dx$

$5e^{\cos -2x} + C$

8) $\displaystyle\int \frac{5e^{-3 + \ln 3x}}{x}\,dx$

$5e^{-3 + \ln 3x} + C$