Name : _____ Score : _____

Teacher : _____ Date : _____

Integration by Substitution

Find each indefinite integral using the substitution provided.

1) $\int \left(\frac{-e^{3+\ln 2x}}{x}\right)dx$

$u = 3 + \ln 2x$

2) $\int \left((10x + 18x^2)e^{5x^2 + 6x^3}\right)dx$

$u = 5x^2 + 6x^3$

3) $\int \left(\frac{-160x^3 - 72x}{10x^4 + 9x^2}\right)dx$

$u = 10x^4 + 9x^2$

4) $\int \left(\frac{64x^3 + 200x^4}{4x^4 + 10x^5}\right)dx$

$u = 4x^4 + 10x^5$

5) $\int \left(\frac{1}{x(2 + \ln 9x)}\right)dx$

$u = 2 + \ln 9x$

6) $\int \left(\frac{-96x^3 - 72x}{6x^4 + 9x^2}\right)dx$

$u = 6x^4 + 9x^2$

7) $\int \left(\frac{8}{x(10 + \ln 4x)}\right)dx$

$u = 10 + \ln 4x$

8) $\int \left(\frac{4}{x(10 + \ln x)}\right)dx$

$u = 10 + \ln x$

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Integration by Substitution

Find each indefinite integral using the substitution provided.

9) $\int \left(\frac{1}{x(5 + \ln 4x)}\right)dx$

$u = 5 + \ln 4x$

10) $\int \left(\frac{7e^{6+\ln 8x}}{x}\right)dx$

$u = 6 + \ln 8x$

11) $\int \left(\frac{-5e^{2+\ln 4x}}{x}\right)dx$

$u = 2 + \ln 4x$

12) $\int \left((-12x^3 - 18x^2)e^{x^4 + 2x^3}\right)dx$

$u = x^4 + 2x^3$

13) $\int \left(\frac{-2e^{2+\ln 8x}}{x}\right)dx$

$u = 2 + \ln 8x$

14) $\int \left((200x^3 + 25)e^{10x^4 + 5x}\right)dx$

$u = 10x^4 + 5x$

15) $\int \left((30 + 180x^4)e^{5x + 6x^5}\right)dx$

$u = 5x + 6x^5$

16) $\int \left(\frac{30x^4 + 4x}{6x^5 + 2x^2}\right)dx$

$u = 6x^5 + 2x^2$

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$u = 3 + \ln 2x$

$-e^{3+\ln 2x} + C$

2) $\int \left((10x + 18x^2)e^{5x^2 + 6x^3}\right)dx$

$u = 5x^2 + 6x^3$

$e^{5x^2 + 6x^3} + C$

3) $\int \left(\frac{-160x^3 - 72x}{10x^4 + 9x^2}\right)dx$

$u = 10x^4 + 9x^2$

$-4\ln|\ 10x^4 + 9x^2\ | + C$

4) $\int \left(\frac{64x^3 + 200x^4}{4x^4 + 10x^5}\right)dx$

$u = 4x^4 + 10x^5$

$4\ln|\ 4x^4 + 10x^5\ | + C$

5) $\int \left(\frac{1}{x(2 + \ln 9x)}\right)dx$

$u = 2 + \ln 9x$

$\ln|\ 2 + \ln 9x\ | + C$

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$u = 10 + \ln 4x$

$8\ln|\ 10 + \ln 4x\ | + C$

8) $\int \left(\frac{4}{x(10 + \ln x)}\right)dx$

$u = 10 + \ln x$

$4\ln|\ 10 + \ln x\ | + C$

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$u = 5 + \ln 4x$

$\ln|5 + \ln 4x| + C$

10) $\int \left(\frac{7e^{6+\ln 8x}}{x}\right)dx$

$u = 6 + \ln 8x$

$7e^{6+\ln 8x} + C$

11) $\int \left(\frac{-5e^{2+\ln 4x}}{x}\right)dx$

$u = 2 + \ln 4x$

$-5e^{2+\ln 4x} + C$

12) $\int \left((-12x^3 - 18x^2)e^{x^4 + 2x^3}\right)dx$

$u = x^4 + 2x^3$

$-3e^{x^4 + 2x^3} + C$

13) $\int \left(\frac{-2e^{2+\ln 8x}}{x}\right)dx$

$u = 2 + \ln 8x$

$-2e^{2+\ln 8x} + C$

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$u = 10x^4 + 5x$

$5e^{10x^4 + 5x} + C$

15) $\int \left((30 + 180x^4)e^{5x + 6x^5}\right)dx$

$u = 5x + 6x^5$

$6e^{5x + 6x^5} + C$

16) $\int \left(\frac{30x^4 + 4x}{6x^5 + 2x^2}\right)dx$

$u = 6x^5 + 2x^2$

$\ln|6x^5 + 2x^2| + C$