Name : _____ Score : _____

Teacher : _____ Date : _____

Integration by Substitution

Find each indefinite integral using the substitution provided.

1) $\int \left(\frac{54x + 36x^3}{9x^2 + 3x^4}\right)dx$

$u = 9x^2 + 3x^4$

2) $\int \left(\frac{8e^{10+\ln 1x}}{x}\right)dx$

$u = 10 + \ln 1x$

3) $\int \left((32x^3 + 120x^2)e^{2x^4 + 10x^3}\right)dx$

$u = 2x^4 + 10x^3$

4) $\int \left((15 + 120x^4)e^{5x + 8x^5}\right)dx$

$u = 5x + 8x^5$

5) $\int \left(\frac{-2e^{6+\ln 3x}}{x}\right)dx$

$u = 6 + \ln 3x$

6) $\int \left(\frac{225x^4 + 10x}{9x^5 + x^2}\right)dx$

$u = 9x^5 + x^2$

7) $\int \left(\frac{-3e^{6+\ln 10x}}{x}\right)dx$

$u = 6 + \ln 10x$

8) $\int \left(\frac{2e^{1+\ln 4x}}{x}\right)dx$

$u = 1 + \ln 4x$

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Teacher : _____ Date : _____

Integration by Substitution

Find each indefinite integral using the substitution provided.

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

$u = 7 + \ln 8x$

10) $\int \left(\frac{15e^{3x}}{e^{3x} + 1}\right)dx$

$u = e^{3x} + 1$

11) $\int \left(\frac{10}{x(8 + \ln 3x)}\right)dx$

$u = 8 + \ln 3x$

12) $\int \left(\frac{-5e^{6+\ln 10x}}{x}\right)dx$

$u = 6 + \ln 10x$

13) $\int \left(\frac{30x^4 + 120x}{x^5 + 10x^2}\right)dx$

$u = x^5 + 10x^2$

14) $\int \left(\frac{56x^3 + 6}{7x^4 + 3x}\right)dx$

$u = 7x^4 + 3x$

15) $\int \left(\frac{160x + 96x^3}{10x^2 + 3x^4}\right)dx$

$u = 10x^2 + 3x^4$

16) $\int \left((112x^3 + 21)e^{4x^4 + 3x}\right)dx$

$u = 4x^4 + 3x$

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1) $\int \left(\frac{54x + 36x^3}{9x^2 + 3x^4}\right)dx$

$u = 9x^2 + 3x^4$

$3\ln| 9x^2 + 3x^4 | + C$

2) $\int \left(\frac{8e^{10+\ln 1x}}{x}\right)dx$

$u = 10 + \ln 1x$

$8e^{10+\ln 1x} + C$

3) $\int \left((32x^3 + 120x^2)e^{2x^4 + 10x^3}\right)dx$

$u = 2x^4 + 10x^3$

$4e^{2x^4 + 10x^3} + C$

4) $\int \left((15 + 120x^4)e^{5x + 8x^5}\right)dx$

$u = 5x + 8x^5$

$3e^{5x + 8x^5} + C$

5) $\int \left(\frac{-2e^{6+\ln 3x}}{x}\right)dx$

$u = 6 + \ln 3x$

$-2e^{6+\ln 3x} + C$

6) $\int \left(\frac{225x^4 + 10x}{9x^5 + x^2}\right)dx$

$u = 9x^5 + x^2$

$5\ln| 9x^5 + x^2 | + C$

7) $\int \left(\frac{-3e^{6+\ln 10x}}{x}\right)dx$

$u = 6 + \ln 10x$

$-3e^{6+\ln 10x} + C$

8) $\int \left(\frac{2e^{1+\ln 4x}}{x}\right)dx$

$u = 1 + \ln 4x$

$2e^{1+\ln 4x} + C$

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$4\ln|7 + \ln 8x| + C$

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15) $\int \left(\frac{160x + 96x^3}{10x^2 + 3x^4}\right)dx$

$u = 10x^2 + 3x^4$

$8\ln|10x^2 + 3x^4| + C$

16) $\int \left((112x^3 + 21)e^{4x^4 + 3x}\right)dx$

$u = 4x^4 + 3x$

$7e^{4x^4 + 3x} + C$