Name : _____ Score : _____

Teacher : _____ Date : _____

Integration by Parts

Find each indefinite integral using the substitution provided.

1) $\int \ln(x)\,dx$

$u = \ln(x)$; $dv = \ln(x)\,dx$

2) $\int xe^{-x}\,dx$

$u = x$; $dv = e^{-x}\,dx$

3) $\int x\sqrt{x+8}\,dx$

$u = x$; $dv = \sqrt{x+8}\,dx$

4) $\int x^5\sqrt{x^3+4}\,dx$

$u = x^3$; $dv = x^2\sqrt{x^3+4}\,dx$

5) $\int x^2\cos(4x)\,dx$

$u = x^2$; $dv = \cos(4x)\,dx$

6) $\int x^2 e^{3x}\,dx$

$u = x^2$; $dv = e^{3x}\,dx$

7) $\int e^{-x}\cos(2x)\,dx$

$u = e^{-x}$; $dv = \cos(2x)\,dx$

8) $\int (2x+5)\cos(\frac{x}{4})\,dx$

$u = 2x + 5$; $dv = \cos(\frac{x}{4})\,dx$

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Integration by Parts

Find each indefinite integral using the substitution provided.

1) $\int \ln(x)\,dx$

$u = \ln(x)$; $dv = \ln(x)\,dx$

$x\ln(x) - x + C$

2) $\int xe^{-x}\,dx$

$u = x$; $dv = e^{-x}\,dx$

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

3) $\int x\sqrt{x + 8}\,dx$

$u = x$; $dv = \sqrt{x + 8}\,dx$

$\frac{2}{15}(x + 8)^{\frac{3}{2}}(3x - 16) + C$

4) $\int x^{5}\sqrt{x^{3} + 4}\,dx$

$u = x^{3}$; $dv = x^{2}\sqrt{x^{3} + 4}\,dx$

$\frac{2}{45}(x^{3} + 4)^{\frac{3}{2}}(3x^{3} - 8) + C$

5) $\int x^{2}\cos(4x)\,dx$

$u = x^{2}$; $dv = \cos(4x)\,dx$

$\frac{x^{2}\sin(4x)}{4} + \frac{2x\cos(4x)}{16} - \frac{2\sin(4x)}{64} + C$

6) $\int x^{2}e^{3x}\,dx$

$u = x^{2}$; $dv = e^{3x}\,dx$

$\frac{x^{2}e^{3x}}{3} - \frac{2xe^{3x}}{9} + \frac{2e^{3x}}{27} + C$

7) $\int e^{-x}\cos(2x)\,dx$

$u = e^{-x}$; $dv = \cos(2x)\,dx$

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

8) $\int (2x + 5)\cos(\frac{x}{4})\,dx$

$u = 2x + 5$; $dv = \cos(\frac{x}{4})\,dx$

$(8x + 20)\sin(\frac{x}{4}) + 32\cos(\frac{x}{4}) + C$