6.3 Integration by Parts Worksheet

$\int u\,dv = uv - \int v\,du$ **The "trick" for using this technique correctly is to choose the dv properly – dv should be the derivative of something times dx. The dv should also take up as much as possible of the integrand.**

Use u = L ogarithmic I nverse Trigonometric P olynomial E xponential T rigonometric

Evaluate the integrals below.

1. $\int \cos^{-1} x\,dx$

(Hint: u = $\cos^{-1} x$, dv = dx)

2. $\int \frac{x}{3} \csc x \cot x\,dx$

$\left(\text{Hint: } u = \frac{x}{3}\right)$

3. $\int_0^1 \cos^{-1} x\,dx$

(Hint: use the antiderivative that you found in 1, above)

4. $\int x^3 \sin\left(\frac{x}{2}\right) dx$

(Hint: Tabular Integration)

5. $\int_0^{\pi} x^3 \sin\left(\frac{x}{2}\right) dx$

(Hint: use the antiderivative that you found in 4, above)

6. $\int \cos\sqrt{x}\,dx$

(Hint: do a w – substitution first, $w = \sqrt{x}$, $x = w^2$, dx = ?)

7. $\int e^{-3x} \cos \frac{x}{2}\, dx$

(Hint: Do integration by parts twice. When the original integral reappears, replace it with A. Solve for A)

8. $\int_0^{\pi} e^{-3x} \cos \frac{x}{2}\, dx$

(Hint: use the antiderivative found in 7, to the left)

9. $\int \csc^3 x\, dx$

(Hint: choose a dv so that a v is readily apparent)

10. $\int \cos(\ln x^3)\, dx$

11. $\int \log_4 x^2\, dx$