

## Section 8.2: Integration by Parts - Worksheet

**#31.** Evaluate the following integrals. **Note:** some of these problems use integration techniques from earlier sections.

(a) $\int 5xe^{8x+1} dx$	(f) $\int x^2 \sin^{-1}(x) dx$	(k) $\int e^{-2x} \sin(3x) dx$
(b) $\int \arctan(7x) dx$	(g) $\int_0^{\pi/12} x \sec(4x) \tan(4x) dx$	(l) $\int_{-2}^{-1} x \sec^{-1}(x) dx$
(c) $\int x^3 \cos(5x) dx$	(h) $\int \frac{\ln(x)}{x^5} dx$	(m) $\int x \sec^2(5x) dx$
(d) $\int x^3 \cos(5x^4) dx$	(i) $\int x^3 e^{-x^2} dx$	(n) $\int \sin(\sqrt{3x+5}) dx$
(e) $\int_1^e (\ln(x))^2 dx$	(j) $\int_3^6 \frac{dx}{\sqrt{12x-x^2}}$	(o) $\int \frac{x}{\sqrt{5x+1}} dx$

**#32.** Calculate the volume of the solid obtained by revolving the given region about the given axis using (i) the method of disks/washers and (ii) the method of cylindrical shells.

- The region between the graph of  $y = \sqrt{\tan^{-1}(x)}$  and the  $x$ -axis for  $0 \leq x \leq 1$  revolved about the  $x$ -axis.
- The region bounded by the  $y$ -axis, the graph of  $y = \sin(x)$  and the line  $y = 1$  revolved about the  $y$ -axis.
- The region between the graph of  $y = \ln(x)$  and the  $x$ -axis for  $1 \leq x \leq e$  revolved about the line  $x = -2$ .

**#33.** Express  $\int \sin^7(2x) dx$  in terms of  $\int \sin^5(2x) dx$ .

**#34.** Express  $\int \sec^9(4x) dx$  in terms of  $\int \sec^7(4x) dx$ .

**#35.** Find reduction formulas for the following integrals.

(a) $\int \cos^n(3x) dx$	(b) $\int (\ln(x))^n dx$	(c) $\int \sec^n(5x) dx$
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