

1.

a) $-\frac{1}{2}x^3 e^{-2x} - \frac{3}{4}x^2 e^{-2x} - \frac{3}{4}x e^{-2x} - \frac{3}{8}e^{-2x} + C$

b) $\frac{1}{3}(x^2 + 3x + 1) \sin 3x + \frac{1}{9}(2x + 3) \cos 3x - \frac{2}{27} \sin 3x + C$

c) $(x^2 + 3) \cosh x - 2x \sinh x + 2 \cosh x + C$

d) $-x \cot x + \ln|\sin x| + C$

e) $\frac{x^3}{3} \ln x - \frac{x^3}{9} + C$

f) $\frac{1}{2}x \ln x - \frac{1}{2}x + C$

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

h) $\frac{6}{5}e^{-x} \sin 2x - \frac{3}{5}e^{-x} \cos 2x + C$

i) $x \sin^{-1} x + \sqrt{1 - x^2} + C$

j) $x \tan^{-1} x - \frac{1}{2} \ln(1 + x^2) + C$ (Note: We can drop the absolute value bars for $\ln|1 + x^2|$.)

k) $\frac{2}{3}x(x + 2)^{3/2} - \frac{4}{15}(x + 2)^{5/2} + C$ (or $\frac{2}{5}(x + 2)^{5/2} - \frac{4}{3}(x + 2)^{3/2} + C$, see note in solutions)