INTEGRATION BY PARTS

1. Evaluate the integrals:

   (a) $\int x \cos(5x)dx$

   (b) $\int (y^2 + 2y) \cos(y)dy$

   (c) $\int \ln \sqrt[3]{\heartsuit}\, d\heartsuit$

   (d) $\int \arctan(4t)dt$

   (e) $\int t \sec^2(2t)dt$

   (f) $\int e^{2\theta} z^3 dz$

   (g) $\int \frac{xe^{2x}}{(1+2x)^2}dx$

   (h) $\int r^3 \ln(r)dr$