

Solve the following integrals.

1. (5 pts.) $\int x^3 e^x dx$

2. (5 pts.) $\int e^x \cosh 2x dx$

3. (5 pts.) $\int \frac{16y + 8}{y^2 + 2y} dy$

4. (5 pts.) Write down the sum of the "appropriate" partial fractions for solving the following integral. Do not solve for the undetermined coefficients.

$$\int \frac{6y + 4}{(y^2 + 1)^2 (y + 4)(y + 2)^2} dy$$