

PROBLEMS ON UNDETERMINED COEFFICIENTS

- In each part, find the general solution of the equation(s), using the method of undetermined coefficients (either the book's version, or the version on the handout).
 - $(D^2 - D - 2)y = 2x^3 + 1$.
 - $(D^4 + 2D^3 + D^2)y = x^2$.
 - $(D^2 + 4D + 4)y = e^{3x}$.
 - $(D^2 + 4D + 4)y = x^2e^{-2x}$.
 - $(D^2 + 4D + 4)y = xe^{2x} \cos(3x)$ and $(D^2 + 4D + 4)y = xe^{2x} \sin(3x)$.
 - $(D^2 - 2D + 5)y = x^2e^x \cos(2x)$ and $(D^2 - 2D + 5)y = x^2e^x \sin(2x)$.

- Evaluate the following integrals (think of it as a differential equation).

A.

$$\int x^2 e^{2x} \sin(3x) dx.$$

B.

$$\int x^2 e^{2x} \cos(3x) dx.$$