Ex 3 Solve $y'' + 3y' + 2y = 4x^2$ ——— (1)

$g(x)$

y_p

$m^2 + 3m + 2 = 0$

$m = -1, -2$

$y_c = c_1 e^{-x} + c_2 e^{-2x}$

$D^3 x^2 = 0$

$\left[D^2 - 2\alpha D + (\alpha^2 + \beta^2)\right]^n \quad x^n$

Unboxed part of y is candidate for y_p $\quad x^{n-1}$

y_p

$y_p = A + Bx + Cx^2$ ——— (2)

x

For y_p $D^3(D^2 + 3D + 2)y = 0$

$0, 0, 0 \quad -1, -2$

$y = A + Bx + Cx^2 + Ee^{-x} + Fe^{-2x}$