WRITE YOUR NAME:

MAP 2302 Quiz 10
Tuesday October 8th

Given the nonhomogeneous differential equation

$$y' + 2y = 12t^2$$

find a solution of the form $y = At^2 + Bt + C$ (where A, B, C are constants).

$$\downarrow$$

$$y' = 2At + B$$

Plug into D.E.

$$\underbrace{2At + B}_{y'} + 2\underbrace{(At^2 + Bt + C)}_{y} = 12t^2$$

$$2At + B + 2At^2 + 2Bt + 2C = 12t^2$$

$$2At^2 + (2A + 2B)t + (B + 2C) = 12t^2 + 0t + 0$$

$\Rightarrow$ (i) $2A = 12$ $\Rightarrow A = 6$

(ii) $2A + 2B = 0$ $\qquad 12 + 2B = 0 \Rightarrow 2B = -12 \Rightarrow B = -6$

(iii) $B + 2C = 0$ $\qquad \Rightarrow -6 + 2C = 0 \Rightarrow 2C = 6 \Rightarrow C = 3$

$$\boxed{y = 6t^2 - 6t + 3}$$