

$$y' = 2e^{2x}, \quad y(0) = 3$$

Integrate:

$$\begin{aligned} y &= \int 2e^{2x} dx \\ &= e^{2x} + C \end{aligned}$$

Apply initial condition:

$$y(0) = e^{2(0)} + C = 3$$

$$1 + C = 3$$

$$C = 2$$

So, $y = e^{2x} + 2$