

A.

$$\begin{aligned}\frac{d^2y}{dx^2} &= 3 + 2\frac{dy}{dx} \\ &= 3 + 2(3x + 2y + 1) \\ &= 3 + 6x + 4y + 2 \\ &= 5 + 6x + 4y\end{aligned}$$

B.

$$\begin{aligned}\frac{dy}{dx} &= m + re^{rx} \\ m + re^{rx} &= 3x + 2(mx + b + e^{rx}) + 1 \\ (3 + 2m)x + (2b - 1 - m) + (2 - r)e^{rx} &= 0 \\ 3 + 2m = 0, 2b - 1 - m = 0, 2 - r = 0 \\ m = -\frac{3}{2}, r = 2, b = -\frac{1}{4}\end{aligned}$$

C. Approximate value of $f(1) = \frac{9}{4}$

$(0, 2)$	$\frac{dy}{dx} = 5$	$y = 5(x - 0) - 2$	$\left(\frac{1}{2}, \frac{1}{2}\right)$
$\left(\frac{1}{2}, \frac{1}{2}\right)$	$\frac{dy}{dx} = \frac{7}{2}$	$y = \frac{7}{2}\left(x - \frac{1}{2}\right) + \frac{1}{2}$	$\left(1, \frac{9}{4}\right)$

D.

$(0, k)$	$\frac{dy}{dx} = 2k + 1$	$y = (2k + 1)(x) + k$ $y = 2k + \frac{1}{2}$	$\left(\frac{1}{2}, 2k + \frac{1}{2}\right)$
$\left(\frac{1}{2}, 2k + \frac{1}{2}\right)$	$\frac{dy}{dx} = \frac{7}{2} + 4k$	$y = \left(\frac{7}{2} + 4k\right)\left(x - \frac{1}{2}\right) + 2k + \frac{1}{2}$	$\left(1, \frac{9}{4} + 4k\right)$