$$2\ddot{x} + 4\dot{x} + 3x = 1 \quad , \quad x(0) = 2 \, , \quad \dot{x}(0) = 1$$

Taking Laplace Transform and applying initial conditions

$$2\left[s^2X(s) - 2s - 1\right] + 4\left[sX(s) - 2\right] + 3X(s) = \frac{1}{s}$$

$$X(s)\left[2s^2 + 4s + 3\right] = 4s + 10 + \frac{1}{s} = \frac{1}{s}\left(4s^2 + 10s + 1\right)$$

$$X(s) = \frac{4s^2 + 10s + 1}{s\left(2s^2 + 4s + 3\right)}$$

Taking partial fraction decomposition step to obtain inverse laplace transform

$$\frac{4s^2 + 10s + 1}{s\left(2s^2 + 4s + 3\right)} = \frac{A}{s} + \frac{Bs + C}{2s^2 + 4s + 3}$$

$$4s^2 + 10s + 1 = A\left(2s^2 + 4s + 3\right) + (Bs + C)s$$

at $s = 0$; $\quad 1 = 3A \quad \boxed{A = \frac{1}{3}}$

Comparing powers of 's' terms –

s^2: $\quad 4 = 2A + B \qquad B = 4 - 2A = 4 - \frac{2}{3} \qquad \boxed{B = \frac{10}{3}}$

s: $\quad 10 = 4A + C \qquad C = 10 - 4A = 10 - \frac{4}{3} = \frac{26}{3} \qquad \boxed{C = \frac{26}{3}}$

$$X(s) = \frac{1}{3s} + \frac{10/3\, s + 26/3}{2s^2 + 4s + 3} = \frac{1}{3s} + \frac{\frac{10}{3}s + \left(\frac{10}{3} + \frac{16}{3}\right)}{2s^2 + 4s + 3}$$

$$= \frac{1}{3s} + \frac{\frac{10}{3}(s+1)}{2s^2 + 4s + 3} + \frac{\frac{16}{3}}{2s^2 + 4s + 3}$$

$$= \frac{1}{3s} + \frac{5}{3}\frac{(s+1)}{(s+1)^2 + (\sqrt{0.5})^2} + \frac{8}{3} \cdot \frac{1}{\sqrt{0.5}} \cdot \frac{\sqrt{0.5}}{(s+1)^2 + (\sqrt{0.5})^2}$$