$$\Rightarrow -10\underline{A} + 25.5i\underline{A} + 6\times10^{-2}+10\underline{A} + .153i + 25.5i\underline{A} = -.16$$

$$\underline{A}(-10+25.5i+10+25.5i) = -.16 - 6\times10^{-2} - .153i$$

$$\underline{A}(51i) = -.22 - .153i$$

$$\underline{A} = \frac{-.22-.153i}{51i} \approx +.0043i - .003$$

$$\underline{B} = -6\times10^{-3} - \underline{A} = -6\times10^{-3} + -.0043i + .003 = -.003 - .0043i = \underline{A}^*$$

particular solution is:

$$\boxed{x(t) = x_{eq} + (.0043i - .003)e^{(-10+25.5i)t} + (-.003 - .0043i)e^{(-10-25.5i)t}}$$

NOTE THAT, EVEN THOUGH EACH OF THE EXPONENTIAL TERMS IN THE ABOVE EQUATION IS COMPLEX, $x(t)$ is REAL because they are COMPLEX CONJUGATE of each other.

Using arguments similar to the ones in Pr. 2(a), we can cast this in a form similar to the solution to PS#1, Pr. 3(b):

$$x(t) = x_{eq} + e^{-bt/2}\left[\underline{A}e^{i\omega' t} + \underline{A}^* e^{-i\omega' t}\right]$$

(with $\underline{A} = (-0.003 + i\,0.0043)\,m$, $b = 20\,s^{-1}$,

$\omega' = \sqrt{\omega_0^2 - b^2/4} = 25.5\,s^{-1}$)

$$= x_{eq} + 2Ae^{-bt/2}\cos(\omega' t + \phi_0) \quad (\text{with } \underline{A} = Ae^{i\phi_0})$$

$$= \underline{\underline{x_{eq} + 2Ae^{-bt/2}\sin\left(\omega' t + \phi_0 - \frac{\pi}{2}\right)}}$$

$A = \sqrt{(0.003)^2 + (0.0043)^2}\,m$

$\tan\phi_0 = \dfrac{0.0043}{-0.003}$