II. Solve for the inverse Laplace Transform of the ff.

1) $\mathcal{L}^{-1}\left\{\frac{8-3s+s^2}{s^3}\right\} = f(t)$

$F(s) = \frac{8}{s^3} - \frac{3\cancel{s}}{s^{\cancel{3}}} + \frac{s^2}{s^3}$

$F(s) = \frac{8}{s^3} - \frac{3}{s^2} + \frac{1}{s}$

$\mathcal{L}^{-1}\left\{\frac{8}{s^3}\right\} = \frac{2(4)}{s^3} \rightarrow \mathcal{L}\{t^2\}$

$\mathcal{L}^{-1}\left\{\frac{3}{s^2}\right\} = \frac{3}{s^2} \longrightarrow \mathcal{L}\{t\}$

$\mathcal{L}^{-1}\left\{\frac{1}{s}\right\} = \frac{1}{s} \longrightarrow \mathcal{L}\{1\}$

$\boxed{f(t) = 4t^2 - 3t + 1}$

2) $\mathcal{L}^{-1}\left\{\frac{5}{s-2} - \frac{4s}{s^2+9}\right\} = f(t)$

$\mathcal{L}^{-1}\left\{\frac{5}{s-2}\right\} = 5\left\{\frac{1}{s-2}\right\} \longrightarrow \mathcal{L}\{e^{2t}\}$

$\mathcal{L}^{-1}\left\{\frac{4s}{s^2+9}\right\} = 4\left\{\frac{s}{s^2+9}\right\} \longrightarrow \mathcal{L}\{\cos 3t\}$

$\boxed{f(t) = 5e^{2t} - 4\cos 3t}$