

=
$$P(x_1|x_3=0.1) P(x_2|x_3=0.1, x_7=0.2)$$

$$m_{41}(x_{1}) = \begin{cases} x_{4}(x_{1} + x_{4}) dx_{4} = \frac{1}{2}x_{1}x_{4} + \frac{1}{3}x_{4} \\ = \frac{1}{2}x_{1} + \frac{1}{3} \end{cases}$$

$$= \frac{1}{2}x_{1} + \frac{1}{3}$$

$$m_{62}(\chi_2) = \frac{1}{2}\chi_2 + \frac{1}{3}$$
 : $\psi_2 = \frac{1}{2}\chi_2 + \frac{1}{3}$

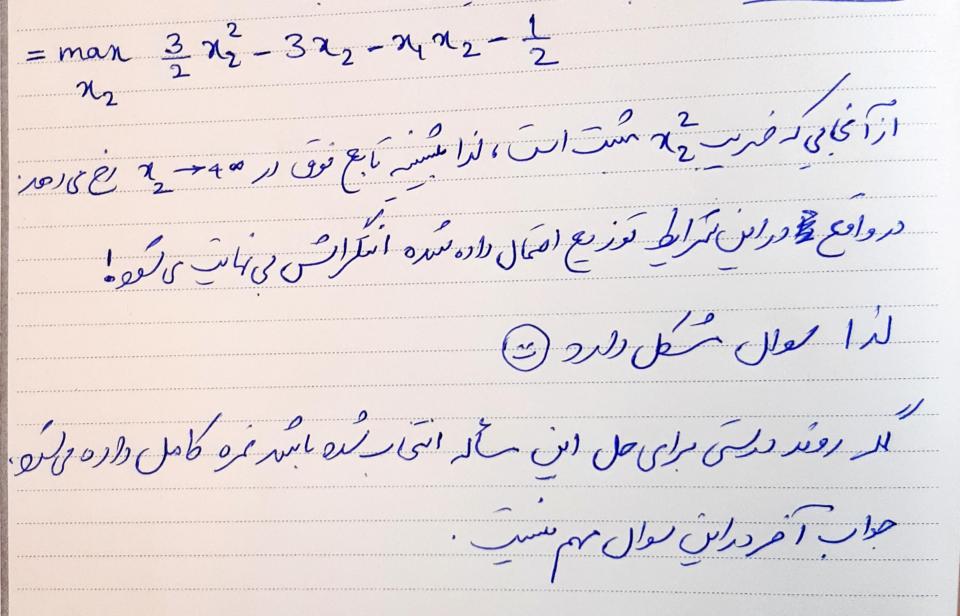
$$m_{32}(n_2) = \max_{n_3} \log \phi(n_3) + \log \phi(n_2, n_3)$$

$$= man -\frac{1}{2} (\chi_3 - 1)^2 - \chi_2 \chi_3$$

$$\frac{\partial f}{\partial x_3} = -x_3 + 1 - x_2 = 0 \Rightarrow \left[x_3 = 1 - x_2 \right]$$

$$\Rightarrow m_{32}(\chi_2) = -\frac{1}{2}\chi_2^2 - \chi_2(1-\chi_2) = \frac{1}{2}\chi_2^2 - \chi_2$$

$$m_{21}(x_1) = max \log \phi(x_2) + \log \phi(x_1, x_2) + m_{32}(x_2) + \dots + m_{62}$$



$$log 9(z_1) = E_{z_1, z_3} \left[log P(z_1, z_2, z_3, x) \right] + const$$

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$$log P(z_1, z_2, z_3, x) = log P(z_1) P(z_2) P(z_3|z_1, z_2) + const$$

$$= log Z_1 - z_1 - \frac{1}{2} z_2^2 - \frac{1}{2} (z_3 - z_1 - z_2)^2 - \frac{1}{2} (x_3 - z_3)^2 + const$$

$$= log 9(z_1) = log Z_1 - z_1 + z_1 E[z_3] + z_1 E[z_2] + const$$

$$= -z_2^2 + \left(E[z_1] + E[z_3] \right) z_2 + const$$

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$$\log 9(\mathbf{Z}_3) = -\frac{1}{2} Z_3^2 + Z_3 (E[Z_1] + E[Z_2]) - \frac{1}{2} Z_3^2 + \lambda Z_3 + const$$

$$= -Z_3^2 + Z_3 (E[Z_1] + E[Z_2] + \lambda) + const$$

