

# Assignment 1

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## 1 Question 1

vnmvmnm gkjg jkg kjghg

### 1.1 1st Subsection

More stuff!

### 1.2 Find the marginal distribution $p(x_a|b_a)$ in which $x_c$ has been marginalized out

We use formulas (2.97)

$$\mu_{ab} = \mu_a - \Lambda_{aa}^{-1} \Lambda_{ab} (x_b - \mu_b)$$

and equations (2.79)

$$\Lambda_{aa} = (\Sigma_{aa} - \Sigma_{ab} \Sigma_{bb}^{-1} \Sigma_{ba})^{-1}$$

and (2.80)

$$\Lambda_{ab} = -(\Sigma_{aa} - \Sigma_{ab} \Sigma_{bb}^{-1} \Sigma_{ba})^{-1} \Sigma_{ab} \Sigma_{bb}^{-1}$$

insertion gives

$$\mu_{ab} = \mu_a - (\Sigma_{aa} - \Sigma_{ab} \Sigma_{bb}^{-1} \Sigma_{ba}) (-(\Sigma_{aa} - \Sigma_{ab} \Sigma_{bb}^{-1} \Sigma_{ba})^{-1} \Sigma_{ab} \Sigma_{bb}^{-1}) (x_b - \mu_b)$$

$$\Leftrightarrow \mu_{ab} = \mu_a + \Sigma_{ab} \Sigma_{bb}^{-1} (x_b - \mu_b)$$

$$mu_{a|b}$$