1.4

№4 Теорие

1) A^{-1} - сим => $\exists$ Ортог. пр-ие:

$$S^{-1}A^{-1}S = S^TA^{-1}S = \underbrace{\Lambda}_{diag}$$

Замена:

$$\boxed{\tilde{y} - y = Sz}$$

$$\tilde{y} \sim \frac{1}{(\sqrt{2\pi})^{\ell}\sqrt{\det\Lambda}} e^{-\frac{z^T\Lambda z}{2}} =$$

$$= \prod_{i=1}^{\ell} \frac{1}{(\sqrt{2\pi})^{\ell}\sqrt{\lambda_i}} \cdot e^{-\frac{z_i^2\lambda_i}{2}}$$

Значит $\int\limits_{-\infty}^{+\infty} p(\tilde{y})\, dy_1 \ldots dy_\ell = \prod\limits_{i=1}^{\ell} \int\limits_{-\infty}^{+\infty} p(z_i) dz_i$

$$\|$$

нормирован. → $\underline{1}$

2.

$$\tilde{y} \sim \frac{1}{(\sqrt{2\pi})^{\ell} \sqrt{(\det A)}} e^{-\frac{(\tilde{y}-y)^{T} A^{-1} (\tilde{y}-y)}{2}}$$

$$\langle\langle \tilde{y}_i \tilde{y}_j \rangle\rangle = A_{ij}$$

$$\tilde{y}_i - y_i \longrightarrow \frac{\tilde{y}_i - y_i}{s_i}$$

Тогда

$$\langle\langle \tilde{y}_i \tilde{y}_j \rangle\rangle = s_i s_j A_{ij}$$