8.6.2 $A = P\Sigma_A Q^T \Rightarrow \Sigma_A = P^T A Q \Rightarrow \Sigma_A{}^T = (P^T A Q)^T = Q^T A^T P = \Sigma_{A^T}$ for A^T, use Q as P, P as Q

8.6.3 $\mathrm{rank}(A) = m = n$

8.6.7. $\because A = P\Sigma_A Q^T \therefore A^{-1} = (P\Sigma_A Q^T)^{-1} = (Q^T)^{-1}\Sigma_A{}^{-1}P^{-1} = Q\Sigma_A{}^{-1}P^T \therefore \Sigma_{A^{-1}} = \Sigma_A{}^{-1}$ ✓

8.6.11 $\because A = U\Sigma V^T \therefore A^T = (U\Sigma V^T)^T = V\Sigma^T U^T$

8.6.4 a. A^T single values : $\sigma_1, \dots, \sigma_r$

b. $t\sigma_1, \cdots, t\sigma_r$ ✓

c. $\frac{1}{\sigma_1}, \cdots, \frac{1}{\sigma_r}$

Example. 1. $\lambda_1 = 10, \lambda_2 = 3, \lambda_3 = 2, \lambda_4 = 1$

$\sigma_1 = 10, \sigma_2 = 9.15, \sigma_3 = 2.28, \sigma_4 = 0.29$, not same

2. $\Sigma_{A^T} = \begin{pmatrix} 10 & & & \\ & 9.15 & & \\ & & 2.28 & \\ & & & 0.29 \end{pmatrix}$, $\Sigma_{A^T} = (\Sigma_A)^T = \Sigma_A$

3. $\Sigma_{A^{-1}} = \begin{pmatrix} 3.48 & & & \\ & 0.44 & & \\ & & 0.11 & \\ & & & 0.1 \end{pmatrix}$, $\mathrm{diag}(\Sigma_{A^{-1}}) = \frac{1}{\mathrm{diag}(\Sigma_A)}$