

MAI0142  
Hand in Problems – 2

1. For the central Wishart distribution derive the cumulants of order 1 and 2.
2. Let  $\mathbf{W} \sim W_p(k\mathbf{I}, n)$ ,  $p \leq n$ . Show that

$$V = \frac{|\mathbf{W}|}{\left(\frac{1}{p} \text{trace}\{\mathbf{W}\}\right)^p}$$

and  $\text{trace}\{\mathbf{W}\}$  are independently distributed (consult some book and try to follow a proof).

3. Let  $\mathbf{W} \sim W_p(\boldsymbol{\Sigma}, n)$ ,  $p \leq n$  and  $\mathbf{A}: p \times q$ . Derive  $E[\mathbf{A}(\mathbf{A}'\mathbf{W}\mathbf{A})^{-1}\mathbf{A}'\mathbf{W}]$ .