

- (b) use (a) to prove Theorem 4 (Cramér–Wold Device).
- 7. In Example 9, show
 - (a) $\hat{\rho}_n$ is a consistent and asymptotically normal estimate of ρ .
 - (b) if $\mathbf{Z}_i \sim \text{i.i.d. } \mathcal{N}(\boldsymbol{\mu}, \boldsymbol{\Sigma})$, the asymptotic variance of $\hat{\rho}_n$ is $(1 - \rho^2)^2$.