$$= \left(\frac{1}{N} \sum_{n=1}^{N} \frac{1}{G} \exp(F)(\text{-}y_n z_n), \ \frac{1}{N} \sum_{n=1}^{N} \frac{1}{G} \exp(F)(\text{-}y_n) \right) = \left(\frac{1}{N} \sum_{n=1}^{N} p_n(\text{-}y_n z_n), \ \frac{1}{N} \sum_{n=1}^{N} p_n(\text{-}y_n) \right)$$