

LINEAR MODELS AND DECISIONS MIDTERM-III

A OF RANK R , $A = FR'$ WITH F, R OF R LINEARLY INDEPENDENT COLUMNS

$$A^{\#} = R(R'R)^{-1}(F'F)^{-1}F'$$

$Y = AB + Q$, B A CONSTANT VECTOR, $E(Q) = 0$, $V(Q) = AA^{\#}$

$$\hat{B} = A^{\#}Y$$

$$\hat{Y} = A\hat{B}$$

$$\hat{Q} = Y - \hat{Y}$$

20 36) FIND $E(Y)$, $E(\hat{Y})$, $E(Q)$, AND $E(\hat{Q})$

20 37) FIND $V(Y)$

20 38) FIND $V(\hat{Y})$

20 39) FIND $V(\hat{Q})$

20 40) FIND $V(\hat{Q})$

HINT! REDUCE TERMS AS FAR AS POSSIBLE INSIDE THE VARIANCE OPERATOR BEFORE SUBSTITUTING IN THE DEFINITION FOR VARIANCE (OR ITS REDUCED FORM). SEE EARLIER HOMEWORK FOR IDENTITIES INVOLVING A AND $A^{\#}$.