

LINEAR MODELS AND DECISIONS

1) FIND $E(\varepsilon)$

2) EXPLAIN WHY $E(E(X)) = E(X)$

3) EXPLAIN WHY $E(A'X) = A'E(X)$ FOR A A VECTOR OF CONSTANTS

4) FIND $E(X\varepsilon)$ IF $E(\varepsilon) = 0$, X A CONSTANT MATRIX

5) EXPLAIN WHY $E[X E(X)'] = E[E(X) X'] = E(X) E(X)'$

6) EXPLAIN WHY $V(A'X) = A'V(X)A$, $V(X+A) = V(X)$ FOR X A RANDOM VECTOR, A A CONSTANT, A A CONSTANT VECTOR

7) FIND $E(X)$, FOR X A MATRIX OF SCALARS

8) SHOW $V(A'X) = V(X'A) = A'V(X)A$ A A CONSTANT VECTOR, X A RANDOM VECTOR

[NOTE: SCALARS ARE ALWAYS COMMUTATIVE]

9) EXPLAIN WHY $X'kX = kX'X$ FOR k A SCALAR

10) SHOW $V(\varepsilon) = E(\varepsilon\varepsilon')$ FOR $E(\varepsilon) = 0$