Name: _____

Matricola: _____ email: _____

ECONOMETRICS - 05-04-2017 - Time: 2 h 30'

1. Say if the following statements are unambiguously true (TRUE), unambiguously false (FALSE) or impossible to classify the way they are stated (CAN'T SAY). Write the motivations to your answers **only** in the space provided. A "CAN'T SAY" answer with no motivations will be considered wrong.

   (a) Projection matrices are singular.

   TRUE ◯ FALSE ◯ CAN'T SAY ◯

   (b) If $E(y|x) = 0$, then the regression function is constant.

   TRUE ◯ FALSE ◯ CAN'T SAY ◯

   (c) If $E(y|x) = x^2$, then the linear model $y_i = \beta_0 + \beta_1 x_i + \varepsilon_i$ is heteroskedastic.

   TRUE ◯ FALSE ◯ CAN'T SAY ◯

   (d) If $X_n \xrightarrow{\text{p}} 2$, then the probability that $3 \leq X_n \leq 4$ tends to 0 as $n \to \infty$.

   TRUE ◯ FALSE ◯ CAN'T SAY ◯

   (e) When a coefficient is "significant" we can safely exclude that the associated variable is irrelevant.

   TRUE ◯ FALSE ◯ CAN'T SAY ◯

2. Suppose you estimated a linear model for a variable whose sample variance is $S^2 = \frac{1}{n-1}\sum_{i=1}^{n}(y_i - \bar{y})^2 = 100$ and you find that $R_c^2 = 50\%$ and $\hat{\sigma}^2 = 47.5$. What is the sample size?

$$n = _____$$

3. 1000 individuals were interviewed about the amount of beer they drink. Table 1 contains estimates of a model that relates the log of beer consumption for individual i as a function of:

l_income	log of individual's income
l_pbeer	Log of price of beer available to the individual
l_pwine	Log of price of wine available to the individual

Comment on the estimated coefficients, giving an economic interpretation in term of elasticities.

Dependent variable: l_beer

	Coefficient	Std. Error	t-ratio	p-value
const	−1.54775	0.488691	−3.167	0.0016
l_income	0.777901	0.0629881	12.35	0.0000
l_pbeer	−0.697641	0.371832	−1.876	0.0609
l_pwine	−0.0397352	1.10221	−0.03605	0.9712

Mean dependent var	2.784718	S.D. dependent var	1.104263
Sum squared resid	1035.023	S.E. of regression	1.019402
R^2	0.150351	Adjusted R^2	0.147791
$F(3, 996)$	58.74942	P-value(F)	5.67e–35

Table 1: Demand for beer