1. 解釋名詞 (30%)

   (1) Tests of Homogeneity

   (2) Moderating Variable

   (3) McNemar Test

   (4) Interval Estimation

   (5) Confidence Interval

   (6) Variance

   (7) Inductive Statistics

   (8) Central Limit Theorem

   (9) Goodness of Fit Test

   (10) Poisson Distribution

2. Given 6 pairs of points (X, Y) shown below. What line of the form y = a + bx best fit the data by method of least squares. (10%)

X	2	-1	5	4	2	3
Y	3	8	1	5	6	3

3. A confidence interval for a normal population mean, 6 ± 0.568 was constructed with a sample of size 196 and a 0.95 confidence coefficient. If the population variance was known, what is it? (10%)

4. Suppose that X_1, X_2, ..., X_n are independent Bernoulli random variables and $f(x|\theta) = \theta^x(1-\theta)^{1-x}$, $x = 0, 1$, where θ is unknown. Further, suppose that θ is chosen from a uniform distribution on (0, 1). Compute the Bayes estimator of θ. (20%)

5. $f(x, y) = 8xy$，$0 \leq x \leq y \leq 1$，分別計算出 $f(x)$, $f(y)$, $f(x|y)$, $P(x \leq 1/2|y = 3/4)$。(20%)

6. 證明 Markov's inequality (10%)

   （提示：$P\{X \geq a\} \leq \dfrac{E[X]}{a}$ ）