1. The sales volume (in thousand dollars) for three different types of in-store promotions is shown below. To test the effect of in-store promotion on sales, please fill the one-way ANOVA table. (18%)

   Sales Volume for Three of In-Store Promotions

   Promotion-Type 1:　3　4　6　6
   Promotion-Type 2:　2　7　8　8
   Promotion-Type 3:　4　4　8　9

   ANOVA Table

Source	df	SS	MS	F
Treatment	(A)	(D)	(G)	(I)
Error	(B)	(E)	(H)	
Total	(C)	(F)		

2. A confidence interval for a normal population mean, 9 ± 0.336 was constructed with a sample of size 81 and a 0.95 confidence coefficient. If the population variance was known, what is it? (8%)

3. Given 5 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	3	6	5	4
Y	3	2	5	0	6

4. 解釋名詞 (14%)

   (1) Central Limit Theorem
   (2) The second moment
   (3) The third moment
   (4) Poisson Distribution
   (5) Type I and Type II error
   (6) Exponential Distribution
   (7) Inductive statistics

5. 證明題 (50%)

   (1) $F_{a,b,\alpha} = \dfrac{1}{F_{b,a,1-\alpha}}$

   (2) $E[E(Y|X)] = E(Y)$

   (3) $Var[E(Y|X)] + E[Var(Y|X)] = Var(Y)$

   (4) $P(|X - \mu| \geq k\sigma) \leq \dfrac{1}{k^2}$

   (5) $E(s^2) = \sigma^2$，其中 $s^2 = \dfrac{\sum_{i=1}^{n}(x_i - \bar{x})^2}{n-1}$