SMK PAHI KELANTAN (2006)
MATHEMATICS T (PAPER 1)

1. By using the laws of the set algebra, prove that $A \cap (A - B)' = A - B'$. [6]

2. Given that $y = e^{-x} \sin 2x$, show that $\frac{d^2y}{dx^2} + 2\frac{dy}{dx} + 5y = 0$. [6]

3. Given the matrices $A = \begin{pmatrix} 1 & 1 & -1 \\ p & 4 & 2 \\ 7 & -3 & -1 \end{pmatrix}$ and $B = \begin{pmatrix} 1 & q & 3 \\ 2 & 3 & 4 \\ 1 & 5 & r \end{pmatrix}$ satisfy $AB = BA$.

   Find the values of p, q and r. [5]

   Hence solve the simultaneous equations

   $x + y - z = 2$, $2y + z = 5x - 9$ and $7x - 3y - z = 14$. [5]

4. The function f is defined as $f(x) = \begin{cases} (x-2)^2 & , x \le 2 \\ 1 - \frac{a}{x} & , x > 2 \end{cases}$

   If f is continuous at $x = 2$, find the values of a and sketch the graph of f. [8]

5. Express $\frac{1}{r(r-1)}$ in partial fractions. Hence find $\sum_{r=2}^{n} \frac{1}{r(r-1)}$. [6]

6. Sketch, on the same coordinates axes, the graphs of $y = \left|\frac{1}{x+1}\right|$ and $y = 2(x + 1)$.

   Hence, solve the inequality $2(x + 1) < \left|\frac{1}{x+1}\right|$. [7]

7. Using the substitution $u = 5 - 2\cos\theta$, evaluate $\int_0^{\frac{\pi}{2}} \frac{\sin\theta}{(5 - 2\cos\theta)^2}\, d\theta$. [5]

8. Expand $\sqrt{\frac{1-x}{1+2x}}$ as a series of ascending power of x up to the term x^3. [6]

   By taking $x = \frac{1}{30}$, find $\sqrt{58}$ correct to three decimal places. [5]

9. The straight line ℓ_1 which passes through the points $P(-2, 0)$ and $Q(-1, -3)$ intersect the y–axis at the point R. The straight line ℓ_2 is perpendicular to ℓ_1 and passes through the point Q. If ℓ_2 intersects the x–axis and the y–axis at the points M and N respectively, show that $RN : MN = \sqrt{10} : 8$. [10]

10. Find the coordinates of the points of intersection of the curves

    $y = x^2 - 2$ and $y = 2x^3 - 12x$. [5]

    Calculate the area bounded by the curves $y = x^2 - 2$ and $y = 2x^3 - 12x$. [6]

11. Sketch on the same coordinates axes, the graphs of $y = x^3$ and $y = 4x^2 - 1$.

    Hence show that the equation $x^3 - 4x^2 + 1 = 0$ has three real roots. [6]

    Use Newton-Raphson method to find the smaller positive root correct to two decimal places. [5]

12. A curve has the following equation $y = \frac{1}{x^2} - \frac{1}{4x}$. Find the coordinates of the turning point on the curve, and determine if it is a maximum or a minimum point.

    Sketch this curve.

    The tangent to the curve at the point $(4, 0)$ meets the curve once again at the point Q. Find the coordinates of Q. [9]

LEE HOCK LEONG
M.Sc. (Pure Maths) – CGPA 4
B.Sc with Ed. (1st Class Hons.)

LEE HOCK LEONG
M.Sc. (Pure Maths) – CGPA 4
B.Sc with Ed. (1st Class Hons.)

SMK PAHI KELANTAN (2006)
MATHEMATICS T (PAPER 2)

1. Solve the equation $\sin 3\theta + \sin 5\theta = \cos\theta$ for values of θ between 0 and π.

2. *ABC* and *ABCD* are two circles which intersect at *A* and *B*. *DAT* is a tangent to the circle *ABC* and *CBS* is a tangent to the circle *ABDE*.
   Show that *EC* // *DB*. [3]
   If $\angle EAT = 148^\circ$ and $\angle ACB = 56^\circ$, find $\angle BAC$ and $\angle EDA$. [4]

3. Based on previous records, the probability an inter-state football game ends in a draw is 0.42. The football Association schedules 120 inter-state games this season. What is the probability at least 45 games end in draws? [6]

4. A hotel gets its supply of flowers from three gardeners A,B and C on contract. The probability gardener A delivers on time is 0.8, the probability gardener B delivers on time is 0.85, and the probability gardener C delivers on time is 0.9. Because of the competitive prices, the hotel allocates the order to A, B, and C in the ratio of 5 : 3 : 2.
   (a) The hotel makes an order for flowers today. What is the probability that supply is delivered on time? [3]
   (b) If the supply is delayed , what is the probability the gardener making the supply is B? [3]

5. The mean number of faulty items on a production line follows the Poisson distribution. It has a mean of 1.5 per hour.
   (a) What is the probability 2 or more faulty items are made during a one-hour production run? [3]
   (b) What is the probability 3 or more faulty items are made during a two-hour production run? [3]
   (c) What is the shortest interval during which the probability at least one faulty part is made is at least 0.5? [5]

6. In the triangle *ABC*, the point *P* lies on the side *AC* such that $\angle BPC = \angle ABC$. Show that the triangles *BPC* and *ABC* are similar.
   If $AM = 4$ cm, $AC = 8$ cm and $BP = 3$ cm, find the area of triangle *BPC*. [7]

7. In the tetrahedron *ABCD*, $AB = BC = 10$ cm, $AC = 8\sqrt{2}$, $AD = CD = 8$ cm, and $BD = 6$ cm. Show that the line from *C* perpendicular to *AB* and the line from *D* perpendicular to *AB* meet at a point on *AB*.
   Hence, calculate the angle between the plane *ABC* and the plane *ABD*. [8]

8. A four-digit number, in the range 0000 to 9999 inclusive, is formed. Find the probability that
   (a) the number begins or ends with 0, [3]
   (b) the number contains exactly two non-zero digits. [3]

9. The National Cancer Association (*NCA*) and the National Kidney Foundation (*NKF*) have contracts with two agencies to campaign for donation from the public. The monthly donation to *NCA* has a mean of RM 75 900 and a standard deviation of RM 12 200. The monthly donation to *NKF* has a mean of RM 83 300 and a standard deviation of RM 13 400.
   (a) Let X = monthly donation to *NKF* – monthly donation to *NCA*. What are the mean and standard deviation of X? [3]
   (b) Assume that the monthly donations for both the societies follow normal distribution.
      (i) Find the probability *NCA* collects more donations in a certain month. [4]
      (ii) If the total collection of *NCA* and *NKF* is more than RM 165 000, what is the probability *NKF* itself gets more than RM 85 000? [4]

10. The continuous random variable X has probability density function defined by

$$f(x) = \begin{cases} x & ,0 \le x \le 1 \\ 2-x & ,1 < x \le 2 \\ 0 & ,\text{otherwise} \end{cases}$$

   (a) Find E(X) and Var(X). [6]
   (b) Show that the median $\boldsymbol{m}$ of X is 1. [3]
   (c) Show that $P(|X - \boldsymbol{m}| > 0.5) = \frac{1}{4}$. [4]

11. The masses, measured to the nearest kg, of college students were recorded and a cumulative frequency distribution formed as follow,

Mass (kg)	< 39.5	< 44.5	< 49.5	< 54.5	< 59.5	< 64.5	< 69.5
Cum. Freq.	0	8	34	70	90	97	100

   (a) Draw a cumulative frequency curve [3]
   (b) Use the graph to estimate the interquartile and interpercentile ranges [4]

12. The number of ships which anchor at a port every week for 26 particular weeks are as follows,

   32 28 43 21 35 19 25 45 35 32 18 26 30
   26 27 38 42 18 37 50 46 23 40 20 29 46

   (a) Display the data in a stemplot [2]
   (b) Find the median and interquartile range [4]
   (c) Draw a box plot to represent the data [3]
   (d) State the shape of the frequency distribution. Give reason for your answer. [2]

1. $A\cap(A-B)' = A\cap(A\cap B')'$

$= A\cap(A'\cup B) = (A\cap A')\cup(A\cap B)$

$= \emptyset\cup(A\cap(B')') = A-B'$ ✱

2. $y = e^{-x}\sin 2x$

$\therefore \frac{dy}{dx} = -y + 2e^{-x}\cos 2x$

$\therefore \frac{d^2y}{dx^2} = -\frac{dy}{dx} - \left[\frac{dy}{dx}+y\right] - 4e^{-x}\sin 2x$

$\therefore \frac{d^2y}{dx^2} = -2\frac{dy}{dx} - y - 4y$

$\therefore \frac{d^2y}{dx^2} + 2\frac{dy}{dx} + 5y = 0$ ✱

3. $AB = BA$: $\begin{pmatrix} 1+2-1 & q+3-5 & 3+4-r \\ p+8+2 & pq+12+10 & 3p+16+2r \\ 7-2-1 & 7q-9-5 & 21-12-r \end{pmatrix}$

$= \begin{pmatrix} 1+pq+21 & 1+4q-9 & -1+2q-3 \\ 2+3p+28 & 2+12+12 & -2+6-4 \\ 1+5p+7r & 1+20-3r & -1+10-r \end{pmatrix}$

$(1,2)$: $q-2 = 4q-8 \Rightarrow q=2$ ✱

$(2,1)$: $p+10 = 3p+30 \Rightarrow p=-10$ ✱

$(3,1)$: $0 = 1+5p+7r \Rightarrow r=7$ ✱

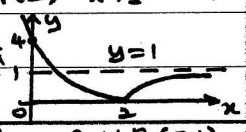
$\therefore AB = 2I \Rightarrow A^{-1} = \frac{1}{2}B$

$\left.\begin{array}{l} x+y-z=-2 \\ 2y+z=5x-9 \\ 7x-3y-z=14 \end{array}\right\}$ $A\begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} -2 \\ -18 \\ 14 \end{pmatrix} \Rightarrow \begin{pmatrix} x \\ y \\ z \end{pmatrix} = A^{-1}\begin{pmatrix} -2 \\ -18 \\ 14 \end{pmatrix}$

$\therefore \begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} 1 & 2 & 3 \\ 2 & 3 & 4 \\ 1 & 5 & 7 \end{pmatrix}\begin{pmatrix} -1 \\ -9 \\ 7 \end{pmatrix} = \begin{pmatrix} 2 \\ -1 \\ 3 \end{pmatrix} \Rightarrow \begin{array}{l} x=2 \\ y=-1 \\ z=3 \end{array}$ ✱

4. f is continuous at $x=2$: $f(2) = \lim_{x\to 2^+} f(x)$

$0 = 1-\frac{a}{2} \Rightarrow a=2$ ✱



5. $f(r) = \frac{1}{r(r-1)} \equiv \frac{A}{r-1} + \frac{B}{r} = \frac{Ar+B(r-1)}{r(r-1)}$

$\therefore 1 \equiv Ar+B(r-1)$

$[r^0]$: $1=-B \Rightarrow B=-1$

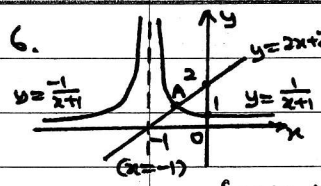
$[r^1]$: $0 = A+B \Rightarrow A=1$

$\therefore f(r) = \frac{1}{r-1} - \frac{1}{r}$ ✱

$\sum_{r=2}^{n} f(r) = \left[\frac{1}{1}+\frac{1}{2}+\dots+\frac{1}{n-1}\right] - \left[\frac{1}{2}+\frac{1}{3}+\dots+\frac{1}{n-1}+\frac{1}{n}\right]$

$= 1-\frac{1}{n}$ ✱

6.



For A: $2(x+1) = \frac{1}{x+1}$

$\therefore (x+1)^2 = \frac{1}{2}$

$\therefore x = -1 \pm \frac{1}{\sqrt{2}}$

$[\because x_A > -1]$: $x_A = -1+\frac{\sqrt{2}}{2}$

For $2(x+1) < \left|\frac{1}{x+1}\right|$: $\{x : x > -1+\frac{\sqrt{2}}{2}\}$ ✱

7. $u = 5-2\cos\theta$: $\frac{du}{d\theta} = 2\sin\theta$

$\int_0^{\pi/3} \frac{\sin\theta}{(5-2\cos\theta)^2}\,d\theta = \int_3^4 \frac{\sin\theta}{u^2}\left(\frac{du}{2\sin\theta}\right)$

$= \frac{1}{2}\int_3^4 \frac{1}{u^2}\,du = -\frac{1}{2}\left[\frac{1}{u}\right]_3^4 = -\frac{1}{2}\left[\frac{1}{4}-\frac{1}{3}\right] = \frac{1}{24}$ ✱

8. $\sqrt{\frac{1-x}{1+2x}} = (1-x)^{\frac{1}{2}}(1+2x)^{-\frac{1}{2}} = f(x)$

$= \left[1+\frac{1}{2}(-x)+\frac{1}{2}\left(\frac{1}{2}\right)\left(-\frac{1}{2}\right)(-x)^2+\frac{1}{6}\left(\frac{1}{2}\right)\left(-\frac{1}{2}\right)\left(-\frac{3}{2}\right)(-x)^3+\dots\right]$

$\left[1+\left(-\frac{1}{2}\right)(2x)+\frac{1}{2}\left(-\frac{1}{2}\right)\left(-\frac{3}{2}\right)(2x)^2+\frac{1}{6}\left(-\frac{1}{2}\right)\left(-\frac{3}{2}\right)\left(-\frac{5}{2}\right)(2x)^3+\dots\right]$

$= \left[1-\frac{1}{2}x-\frac{1}{8}x^2-\frac{1}{16}x^3+\dots\right]\left[1-x+\frac{3}{2}x^2-\frac{5}{2}x^3+\dots\right]$

$= 1+x\left(-\frac{1}{2}-1\right)+x^2\left(\frac{3}{2}+\frac{1}{2}-\frac{1}{8}\right)+x^3\left(-\frac{5}{2}-\frac{3}{4}+\frac{1}{8}-\frac{1}{16}\right)$

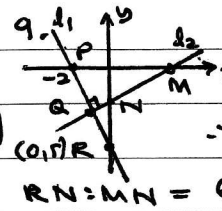
$+\dots = 1-\frac{3}{2}x+\frac{15}{8}x^2-\frac{51}{16}x^3+\dots$ ✱

$f\left(\frac{1}{30}\right) = \sqrt{\frac{29}{30}\Big/\frac{16}{15}} = \sqrt{\frac{58}{64}} = \frac{1}{8}\sqrt{58}$

$\therefore \sqrt{58} = 8\left[1-\frac{3}{2}\left(\frac{1}{30}\right)+\frac{15}{8}\left(\frac{1}{30}\right)^2-\frac{51}{16}\left(\frac{1}{30}\right)^3+\dots\right]$

$= 7.616$ (3dp) ✱

9.



$m_{PQ} = m_{PR}$: $\frac{0+3}{-2+1} = \frac{0-r}{-2-0} \Rightarrow r=-6$

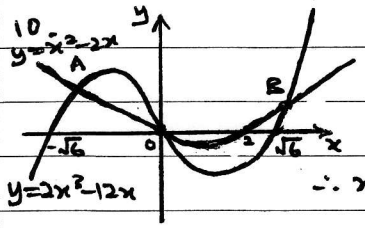
l_2: $\frac{y+3}{x+1} = \frac{1}{3} \Rightarrow 3y = x-8$

$\therefore M(8,0)$ and $N\left(0,-\frac{8}{3}\right)$

$RN : MN = 6-\frac{8}{3} : \sqrt{8^2+\left(\frac{8}{3}\right)^2} = \frac{10}{3} : \frac{8}{3}\sqrt{10}$

$\therefore RN : MN = \sqrt{10} : 8$ ✱

10.



$2x^3-12x = x^2-2x$

$x[2x^2-x-10]=0$

$x=0$ or $(2x-5)(x+2)=0$

$\therefore x = 0, \frac{5}{2}$ or -2

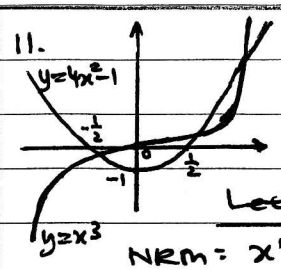
$\therefore$ intersection points $= (0,0), A(-2,8), B\left(\frac{5}{2},\frac{5}{4}\right)$ ✱

Area $= \int_{-2}^{0}(2x^3-x^2-10x)\,dx + \int_0^{2.5}(10x+x^2-2x^3)\,dx$

$= \left[\frac{1}{2}x^4-\frac{1}{3}x^3-5x^2\right]_{-2}^{0} - \left[\frac{1}{2}x^4-\frac{1}{3}x^3-5x^2\right]_0^{2.5}$

$= \left[0-\left(-\frac{28}{3}\right)\right] - \left[-\frac{1625}{96}-0\right] = \frac{2521}{96}$ ✱

11.



$x^3-4x^2+1=0 \Rightarrow x^3 = 4x^2-1$

$y=x^3$ and $y=4x^2-1$ intersect at 3 points

$\Rightarrow$ 3 real roots. ✱

Let $f(x) = x^3-4x^2+1$: $f'(x) = 3x^2-8x$

NRM: $x' = x - \frac{x^3-4x^2+1}{3x^2-8x} = \frac{2x^3-4x^2-1}{3x^2-8x}$

$x_0 = 0.5$: $x_1 = 0.5285 \approx 0.54$

$x_2 = 0.5374 \approx 0.54$

$\therefore$ smaller root $= 0.54$ (2dp) ✱

LEE HOCK LEONG
M.Sc. (Pure Maths) – CGPA 4
B.Sc with Ed. (1st Class Hons.)

12. $y = \frac{1}{x^2} - \frac{1}{4x} \Rightarrow y' = \frac{-2}{x^3} + \frac{1}{4x^2}$

$y'' = \frac{6}{x^4} - \frac{1}{2x^3}$

For $\frac{dy}{dx} = 0$: $-8 + x = 0 \Rightarrow x = 8$

$\therefore$ Turning Point $= (8, -\frac{1}{64})$ ✱

$x = 8$: $y'' = \frac{6}{4096} - \frac{1}{1024} = \frac{1}{2048}$ (>0)

$\therefore (8, -\frac{1}{64})$ is a min. point ✱

$(4, 0)$: $y' = -\frac{2}{64} + \frac{1}{64} = -\frac{1}{64}$

$\therefore$ tangent : $y = \frac{-1}{64}(x-4)$

For Q : $-\frac{1}{64}(x-4) = \frac{1}{x^2} - \frac{1}{4x}$

$\therefore x^3 - 4x^2 - 16x + 64 = 0$

$\therefore (x-4)^2(x+4) = 0$

$\therefore Q(-4, \frac{1}{8})$ ✱

1. $\sin 3\theta + \sin 5\theta = \cos\theta$

$\therefore 2\sin 4\theta\cos\theta - \cos\theta = 0$

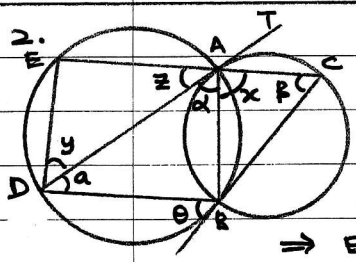
$\therefore \cos\theta[2\sin 4\theta - 1] = 0$

$\therefore \cos\theta = 0$ or $\sin 4\theta = \frac{1}{2}$

$\therefore \theta = \frac{\pi}{2}$ or $4\theta = \frac{\pi}{6}, \frac{5\pi}{6}, \frac{13\pi}{6}, \frac{17\pi}{6}$

$\therefore \theta = \frac{\pi}{2}, \frac{\pi}{24}, \frac{5\pi}{24}, \frac{13\pi}{24}, \frac{17\pi}{24}$ ✱

2.



$\theta = \alpha$ [∠ of alternate segments]

$\alpha = \beta$ [∠ of alternate segments]

$\therefore \theta = \beta$ [a pair of equal corresponding angles]

$\Rightarrow EC // DB$ ✱

$\angle EAT = 148°$: $\angle EAT = \alpha + x$ [opposite angles]

$\therefore 148° = 56° + x$ $[\alpha = \beta = 56°]$

$\therefore x = 92° = \angle BAC$ ✱

$a = z$ [Alternate angles]

$z = 180° - 148° = 32°$ [Supplementary ∠]

$y + a = x$ [Ext. ∠ of cyclic ABDE]

$\therefore y = 92° - 32° = 60° = \angle EDA$ ✱

3. Let X = no. of draws, $X \sim B(120, 0.42)$

$X \sim N(50.4, 29.232)$

$P(X \geq 45) \rightarrow P(X > 44.5)$

$= P(Z > \frac{44.5 - 50.4}{\sqrt{29.232}}) = 0.86242$ ✱

4. (a) Prob. $= \frac{5}{10}(0.8) + \frac{3}{10}(0.85) + \frac{2}{10}(0.9)$

$= 0.835$ ✱

(b) $P(B|\text{Delay}) = \frac{0.3(0.15)}{1 - 0.835} = \frac{3}{11}$ ✱

5. X = no. of faulty items in 1 hour, $X \sim Po(1.5)$

(a) $P(X \geq 2) = 1 - e^{-1.5}[1 + 1.5] = 0.4422$ ✱

(b) $P(X_1 + X_2 \geq 3) = 1 - e^{-3}[1 + 3 + \frac{3^2}{2}] = 0.5768$ ✱

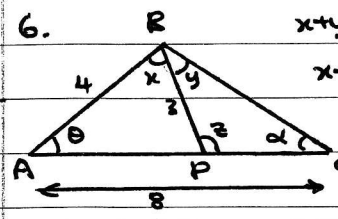
(c) Y = no. of faulty items in k hours.

$P(Y \geq 1) \geq 0.5$: $e^{-1.5k} \leq 0.5$

$\therefore k \geq -1.5\ln 0.5 = 1.040$

$\therefore t_{min} = 1.04$ hours $= 62.4$ minutes ✱

6.



$x + y = z$ [Given]

$x + \theta = z$ [ext ∠ of ΔAPB]

$\therefore \theta = y$

$\angle ACB = \angle BCP$ [common angle]

$\therefore \Delta ABC \sim \Delta BPC$ ✱

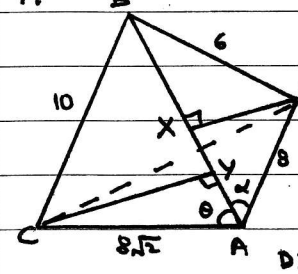
$\frac{AB}{BP} = \frac{AC}{BC} = \frac{BC}{PC}$: $\frac{4}{3} = \frac{8}{BC} = \frac{BC}{PC}$

$\therefore BC = 6$ cm and $PC = 4.5$ cm

$\therefore$ Area of $\Delta BPC = \sqrt{6.75(3.75)(0.75)(2.25)}$

$= \left[\frac{10935}{256}\right]^{1/2} = \frac{27}{16}\sqrt{15}$ cm^2 ✱

7.



$\frac{AX}{8} = \cos\alpha = \frac{8}{10} \Rightarrow AX = 6.4$ cm

$\frac{AY}{8\sqrt{2}} = \cos\theta = \frac{4\sqrt{2}}{10}$

$\therefore AY = 6.4$ $(= AX)$

$\therefore X = Y \Rightarrow$ perpendiculars meet at a same point on AB $(X = Y)$. ✱

$DX = \sqrt{64 - 6.4^2} = 4.8$

$AY = \sqrt{128 - 6.4^2} = \sqrt{87.04}$

$\cos\beta = \frac{4.8^2 + 87.04 - 8^2}{2(4.8)\sqrt{87.04}} \Rightarrow \beta = 59.0°$

$\therefore$ Angle between planes $= 59.0°$ ✱

8. (a) Prob. $= \frac{1}{10} + \frac{1}{10} - (\frac{1}{10})^2 = 0.19$ ✱

(b) Prob $= {}^4C_2(\frac{1}{10})^2(\frac{9}{10})^2 = 0.0486$ ✱

LEE HOCK LEONG
M.Sc. (Pure Maths) – CGPA 4
B.Sc with Ed. (1st Class Hons.)

9(a) $E(X) = 83300 - 75900 = 7400$ *

$S_X = [13400^2 + 12200^2] = \sqrt{3.284 \times 10^8}$

$= 18121.8$ *

(b) $X \sim N(7400, 3.284 \times 10^8)$

(i) $P(X<0) = P(Z < \frac{-7400}{18121.8})$

$= 0.34151$ *

(ii) Let Y (NCA), T (NKF):

$S = Y + T \sim N(159200, 3.284 \times 10^8)$

$T \sim N(83300, 13400^2)$

$P(T > 85000 \mid S > 165000)$

$= \frac{P(T>85000).P(Y>80000)}{P(S>165000)}$

$= \frac{P(Z > \frac{85000-83300}{13400}).P(Z > \frac{80000-75900}{12200})}{P(Z > \frac{165000-159200}{18121.8})}$

$= \frac{(0.44952)(0.36841)}{0.37446} = 0.4423$ *

10.(a) $E(X) = \int_0^1 x^2 dx + \int_1^2 (2x - x^2) dx$

$= \frac{1}{3}[x^3]_0^1 + [x^2 - \frac{1}{3}x^3]_1^2$

$= \frac{1}{3}[1-0] + [4 - \frac{8}{3}] - [1 - \frac{1}{3}] = 1$ *

$E(X^2) = \int_0^1 x^3 dx + \int_1^2 (2x^2 - x^3) dx$

$= \frac{1}{4}[x^4]_0^1 + [\frac{2}{3}x^3 - \frac{1}{4}x^4]_1^2$

$= \frac{1}{4}[1-0] + \frac{2}{3}(8-1) - \frac{1}{4}(16-1) = \frac{7}{6}$

$\therefore Var(X) = \frac{7}{6} - 1^2 = \frac{1}{6}$ *

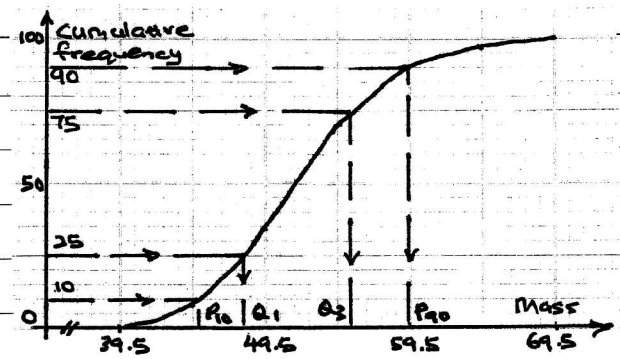
(b) $\int_0^1 x dx = \frac{1}{2}[x^2]_0^1 = \frac{1}{2}(1-0) = \frac{1}{2}$

$\therefore m = 1$ *

(c) $P(|X-1| > 0.5) = P(X<0.5) + P(X>1.5)$

$= \frac{1}{2}(0.5)(0.5) + \frac{1}{2}(0.5)(0.5) = \frac{1}{4}$ *

11(a)



(b) $IQR = Q_3 - Q_1 = 55.5 - 48.0 = 7.5$ *

$IPR = P_{90} - P_{10} = 59.5 - 44.8 = 14.7$ *

12.(a)

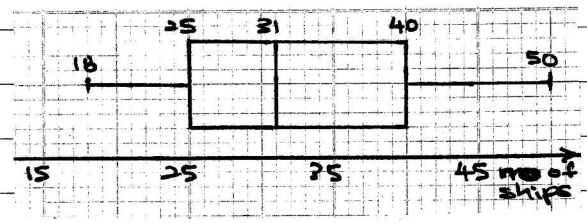
1	8 8 9
2	0 1 3 5 6 6 7 8 9
3	0 2 2 5 5 7 8
4	0 2 3 5 6 6
5	0

key: 1|8 means 18

(b) $m = \frac{1}{2}[x_{13} + x_{14}] = \frac{1}{2}[30+32] = 31$ *

$IQR = x_{20} - x_7 = 40 - 25 = 15$ *

(c)



(d) Distribution is right-skewed, because median is nearer to Q_1 than to Q_3. *

LEE HOCK LEONG
M.Sc. (Pure Maths) – CGPA 4
B.Sc with Ed. (1st Class Hons.)