

WAKISSHA JOINT MOCK EXAMINATIONS
MARKING GUIDE
Uganda Advanced Certificate of Education
SUB MATH S475/1
July/August 2024



SECTION A

1.	<p>a) $2^x = 0.5$ $x \log 2 = \log 0.5$ M1 $x = \frac{\log 0.5}{\log 2} \rightarrow \frac{\log 2^{-1}}{\log 2} = -1$ (M1) $x = -1$ B1</p>	M1															
		02 Marks															
	<p>b) $y^{2/3 \times 3/1} = 4$ $\sqrt{y^2} = \sqrt{4}$ or $(y-2)(y+2) = 0$ $y = \pm 2$ y=2, y=-2</p>	M1 - Indices B1 - square root A1 out put															
		03 Marks															
2.	<p>Tree diagram outcomes:</p>	B1 tree diagram outcomes															
	<p>a) Let the number of heads be x</p> <table border="1" style="display: inline-table; vertical-align: middle;"> <thead> <tr> <th>x</th><th>0</th><th>1</th><th>2</th><th>3</th></tr> </thead> <tbody> <tr> <td>$P(x=x)$</td><td>$1/8$</td><td>$3/8$</td><td>$3/8$</td><td>$1/8$</td></tr> <tr> <td>$xP(x=x)$</td><td>0</td><td>$3/8$</td><td>$6/8$</td><td>$3/8$</td></tr> </tbody> </table> <p>$\sum xP = 12/8$</p> <p>b) $E(x) = \sum xP(x=x) = 12/8 = 1.5$</p>	x	0	1	2	3	$P(x=x)$	$1/8$	$3/8$	$3/8$	$1/8$	$xP(x=x)$	0	$3/8$	$6/8$	$3/8$	B1 for x for P B1 B1 for xp A1 for EA)
x	0	1	2	3													
$P(x=x)$	$1/8$	$3/8$	$3/8$	$1/8$													
$xP(x=x)$	0	$3/8$	$6/8$	$3/8$													
		05 Marks															

1/8 3/8 3/8 1/8
 1/8 3/8 3/8 1/8
 1/8 3/8 3/8 1/8
 1/8 3/8 3/8 1/8
 1/8 3/8 3/8 1/8
 1/8 3/8 3/8 1/8
 1/8 3/8 3/8 1/8
 1/8 3/8 3/8 1/8

3.

Sum of the roots

$$\begin{aligned}
 &= (\alpha^2 + \beta^2) + (\beta^2 + \alpha^2) \\
 &= (\alpha^2 + \beta^2) + (\beta^2 + \alpha^2) \\
 &= (\alpha^2 + \beta^2) - 2\alpha\beta + \left(\frac{\beta^2 + \alpha^2}{\alpha^2\beta^2} \right) \\
 &= (\alpha + \beta)^2 - 2\alpha\beta + \left(\frac{(\alpha + \beta)^2 - 2\alpha\beta}{(\alpha\beta)^2} \right) \\
 &= p^2 - 2q + \left(\frac{p^2 - 2q}{q^2} \right) \\
 &= \frac{p^2 q^2 - 2q^3 + (p^2 - 2q)}{q^2}
 \end{aligned}$$

M1

B1

M1

Product of the roots.

$$\begin{aligned}
 &(\alpha^2 + \beta^2) \times (\beta^2 + \alpha^2) \\
 &= (\alpha\beta)^2 + 1 + 1 + \frac{1}{(\alpha\beta)^2} \\
 &= (\alpha\beta)^2 + 2 + \frac{1}{(\alpha\beta)^2} \\
 &= q^2 + 2 + \frac{1}{q^2}
 \end{aligned}$$

B1

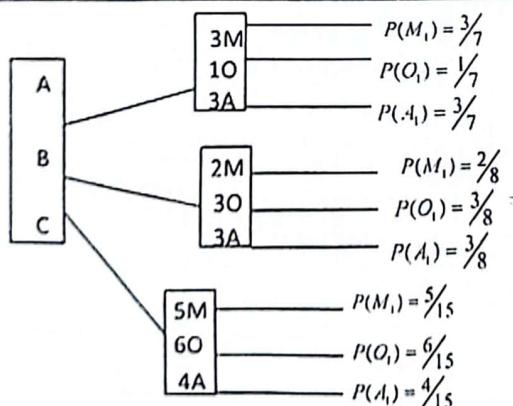
∴ The equation becomes;

$$y^2 - \left[\frac{p^2 q^2 + p^2 - 2q^3 - 2q}{q^2} \right] y + \left[\frac{q^4 + 2q^2 + 1}{q^2} \right] = 0$$

A1

05 Marks

4.

B1 *tree diagram or outcomes*

$$\begin{aligned}
 \text{i)} \quad &\frac{1}{3} \left[\frac{1}{7} + \frac{3}{8} + \frac{6}{15} \right] \\
 &= \frac{257}{840} = 0.306
 \end{aligned}$$

M1

A1

M

ii) $\frac{1}{3} \left[\left(\frac{3}{7} + \frac{3}{7} \right) + \left(\frac{2}{8} + \frac{3}{8} \right) + \left(\frac{5}{15} + \frac{4}{15} \right) \right] = 0.306 \rightarrow M1$

$$= \frac{1}{3} \left(\frac{9}{49} + \frac{6}{64} + \frac{20}{225} \right) \rightarrow A1$$

$$= 0.122 \rightarrow A1 \text{ AKA } 3 \text{ d.p.s}$$

05 Marks

5. $y = x^2 + 6x - 4$

$$\frac{dy}{dx} = 2x + 6$$

at (1, 3)

$$\frac{dy}{dx} = 2(1) + 6$$

$$= 2+6 \\ = 8$$

B1

i) $\frac{y-3}{x-1} = 8 \rightarrow M1$

$$y-3 = 8x-8$$

$$y = 8x-8$$

$$y = 8x-5 \rightarrow A1$$

ii) $m = -\frac{1}{8}$

$$\frac{y-3}{x-1} = -\frac{1}{8}$$

$$8y-24 = -x+1 \rightarrow M1$$

$$8y = -x+1+24$$

$$8y = -x+25$$

$$y = \frac{-x}{8} + \frac{25}{8} \rightarrow A1$$

M1

A1

M1

A1

05 marks

6.

x	8	9	10	11	12	13	14
f	9	15	21	32	19	13	11
fx	72	135	210	352	228	169	154

B1

$$\sum f = 120$$

$$\sum fx = 1320$$

B1

B1

$$\text{Mean} = \frac{\sum fx}{\sum f}$$

$$= \frac{1320}{120} \rightarrow M1$$

$$= 11. \rightarrow A1$$

M1

A1

05 Marks

7.	$\int_{-1}^2 \frac{4x - x^2 + 3x^3}{x} dx$ $= \int_{-1}^2 (4 - x + 3x^2) dx$ $= \left[4x - \frac{x^3}{3} + x^3 \right]_1^2$ $= \left[(4x2) - \frac{2^3}{3} + 2^3 \right] - \left[(4x1) - \frac{(-1)^3}{3} + (-1)^3 \right]$ $= 19.5$ <p style="color: red; margin-left: 100px;">$3\sqrt{2}$</p>	M1 for division M1 BT integration m1 m1 → limits BT-B1
		A1

8.	<p style="color: red; margin-left: 100px;">3x20 B1</p> <p style="color: red; margin-left: 100px;">20C1 B1</p> <p style="color: red; margin-left: 100px;">19C1 B1</p> <p style="color: red; margin-left: 100px;">30C20 x 20! 19! - 1</p> <p style="color: red; margin-left: 100px;">10C10</p>	No. of ways of choosing 20 from 30 = $\binom{30}{20}$ $= \binom{30}{20} x 20 x 19$ $= \frac{30!}{(30-20)!20!} x 20 x 19$ $= 1.14 \times 10^{10}$ ways <p style="color: red; margin-left: 100px;">m1</p>	BT my M1 BT-B1 A1
		05 Marks	05 Marks

9. a) $P^2 + 2Q = R$	$\begin{pmatrix} 4 & 3 \\ -1 & 0 \end{pmatrix} \begin{pmatrix} 4 & 3 \\ -1 & 0 \end{pmatrix} + 2 \begin{pmatrix} 5 & 1 \\ 2 & -1 \end{pmatrix} = R$ $\begin{pmatrix} 16-3 & 12+0 \\ -4+0 & -3+0 \end{pmatrix} + \begin{pmatrix} 10 & 2 \\ 4 & -2 \end{pmatrix} = R$ <p style="margin-left: 100px;">Then $R = \begin{pmatrix} 13 & 12 \\ -4 & -3 \end{pmatrix} + \begin{pmatrix} 10 & 2 \\ 4 & -2 \end{pmatrix}$</p> $R = \begin{pmatrix} 23 & 14 \\ 0 & -5 \end{pmatrix}$	M1 Substn M1 addn & scalar multiplication A1 output
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<p>b) $\begin{pmatrix} 3 & 4 \\ 5 & 1 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 27 \\ 11 \end{pmatrix}$</p> <p>Adjunct $\begin{pmatrix} 1 & -4 \\ -5 & +3 \end{pmatrix}$</p> <p>$\begin{pmatrix} 1 & -4 \\ -5 & +3 \end{pmatrix} \begin{pmatrix} 3 & 4 \\ 5 & 1 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 1 & -4 \\ -5 & +3 \end{pmatrix} \begin{pmatrix} 27 \\ 11 \end{pmatrix}$</p> <p>$\begin{pmatrix} 3-20 & 4-4 \\ -5+15 & -20+3 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 27-44 \\ -135+33 \end{pmatrix}$</p> <p>$\begin{pmatrix} -17 & 0 \\ 0 & -17 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} -17 \\ -102 \end{pmatrix}$</p> <p>$\frac{-17x}{-17} = \frac{-17}{-17}$</p> <p>$x = 1$</p> <p>$\frac{-17x}{-17} = \frac{-102}{-17}$</p> <p>$y = 6$</p>	<p>M1 matrix form</p> <p>M1 Adjunct on both sides.</p> <p>M1 correct multiplication</p> <p>M1 Identity matrix</p> <p>A1</p> <p>A1</p>
<p>c) $3x^2 + 4x + m = 0$</p> <p>Let roots be α and 3α</p> <p>Sum of roots = $\alpha + 3\alpha$ $= 4\alpha$</p> <p>Product of roots = $\alpha(3\alpha)$ $= 3\alpha^2$</p> <p>Sum = $-\frac{b}{a}$ $= -\frac{4}{3}$</p> <p>$4\alpha = -\frac{4}{3}$</p> <p>$\alpha = -\frac{1}{3}$</p> <p>Product = $\frac{c}{a}$ $= \frac{m}{3}$</p> <p>$3\alpha^2 = \frac{m}{3}$</p> <p>$9\alpha^2 = m$</p> <p>$9\left(-\frac{1}{3}\right)^2 = m$</p> <p>$m = 9 \times \frac{1}{9}$</p> <p>$M = 1$</p>	<p>B1 for both</p> <p>B1 for both correct</p> <p>B1 for α correct</p> <p>M1 substn of α</p> <p>M1 substn of α in part</p> <p>A1 output</p>

15 Marks

10.

a)

$$x \leq 20 \rightarrow (i)$$

$$y \leq 35 \rightarrow (ii)$$

$$25x + 10y \leq 600$$

$$5x + 2y \leq 120 \rightarrow (iii)$$

$$0.05x + 0.05y \leq 2$$

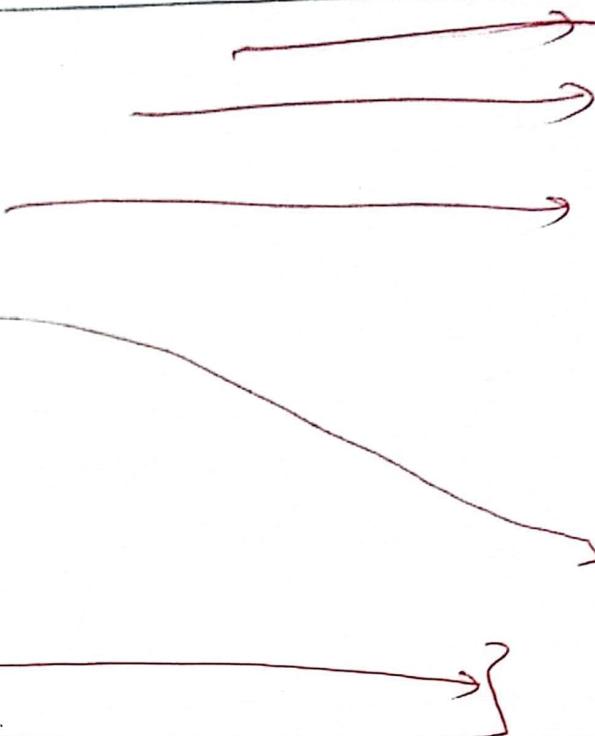
$$\frac{5}{100}x + \frac{5}{100}y \leq 2$$

$$\frac{1}{20}x + \frac{1}{20}y \leq 2$$

$$x + y \leq 40 \rightarrow (iv)$$

$$x \geq 0 \rightarrow (v)$$

$$y \geq 0 \rightarrow (vi)$$



B1

B1

B1

B1

B1

both correct

b) For $x \leq 20$ then $x = 20$ For $y \leq 35$ then $y = 35$ For $x \leq 0$ then $x = 0$ For $y \leq 0$ then $y = 0$ For $5x + 2y = 120$ When $x = 0$ (0,60)

$$y = 60$$

When $y = 0$ (24,0)

$$x = 24$$

For $x + y = 40$ When $x = 0$ (0,40)

$$y = 40$$

When $y = 0$ (40,0)

$$x = 40$$

- c) (x, y)
 $(5, 35), (10, 30), (15, 20), (20, 10)$

For $5x + 2y \leq 120$

Points	x	y	120
5, 30	25	70	95
10, 30	50	60	110
15, 20	75	40	115
20, 10	100	20	120

For $x + y \leq 40$

Points	x	y	40
5, 30	5	35	40
10, 30	10	30	40
15, 20	15	20	35
20, 10	20	10	30

We need 10 bags of beans and 30 bags of flour.

B1

B1

B1

A1

15 marks

objective fn

$$C = 800x + 160y \quad \text{by}$$

Lining out 4 pts. by

computations in the table by

(20, 10) A1

$$\begin{aligned} 11. \quad a) P &= \left(\frac{1 - \sin\theta}{1 + \sin\theta} \right) \left(\frac{1 - \sin\theta}{1 - \sin\theta} \right) \\ &= \frac{1 - 2\sin\theta + \sin^2\theta}{1 - \sin^2\theta} \\ &= \frac{1 - 2\sin\theta + \sin^2\theta}{\cos^2\theta} \end{aligned}$$

Divide through by $\cos^2\theta$

$$\frac{1}{\cos^2\theta} - \frac{2\sin\theta}{\cos^2\theta} + \frac{2\sin^2\theta}{\cos^2\theta}$$

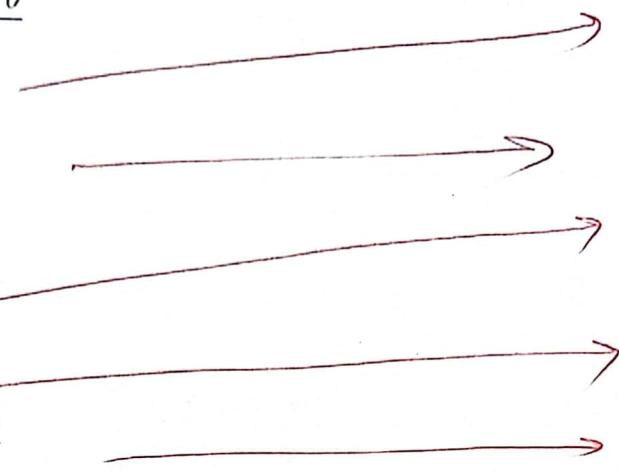
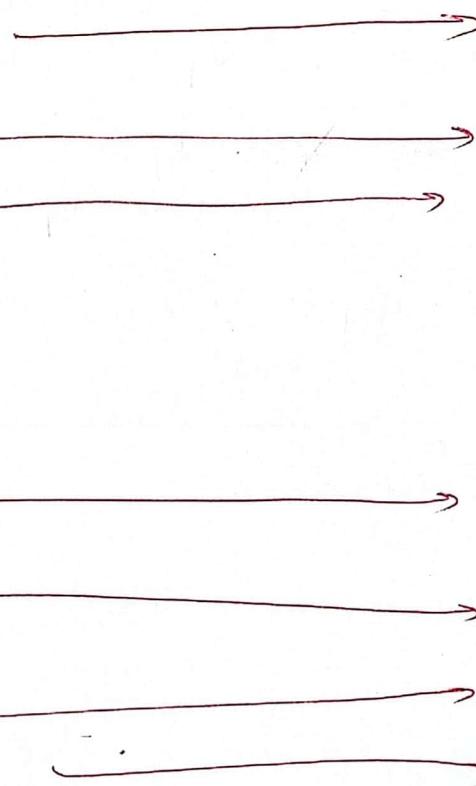
M1 rationalising

M1 expanding &
simplifying
bks.

M1 dividing thru
by $\cos^2\theta$

$$(1 - \sin\theta)^2 \xrightarrow{M1} \frac{(1 - \sin\theta)^2}{\cos^2\theta} \quad M1$$

$$= \left(\frac{1 - \sin\theta}{\cos\theta} \right)^2 = (\sec\theta - \tan\theta)^2 \quad A1$$

$\frac{\sec^2 \theta - 2 \tan \theta \sec \theta + \tan^2 \theta}{1}$ $P = (\sec \theta - \tan \theta)^2$ Hence $P = \left(\frac{1}{\cos 60^\circ} - \tan 60^\circ\right)^2$ $P = \frac{1}{2} - \sqrt{3}$ $= (2 - \sqrt{3})^2$ $= 4 - 4\sqrt{3} + 3$ $= 7 - 4\sqrt{3}$ As required		A1 M1 Subst ^y M1 M1 A1 QP
b) $3\cos^2 x - 2\sin^2 x - \sin x + 1 = 0$ $3(1 - \sin^2 x) - 2\sin^2 x - \sin x + 1 = 0$ $3 - 3\sin^2 x - 2\sin^2 x - \sin x + 1 = 0$ $-5\sin^2 x - \sin x + 4 = 0$ Sum (1) pdf (-20) $5\sin^2 x + 5\sin x - 4\sin x - 4 = 0$ $5\sin x(\sin x + 1) - 4(\sin x + 1) = 0$ $(5\sin x - 4)(\sin x + 1) = 0$ For $5\sin x - 4 = 0$ $\sin x = \frac{4}{5}$ $x = \sin^{-1} \frac{4}{5}$ $= 53.13^\circ, 126.87^\circ$ For $\sin x + 1 = 0$ $\sin x = -1$ $x = \sin^{-1} -1$ $x = 90^\circ, 270^\circ$ Then $x = \{53.13^\circ, 126.87^\circ, 270^\circ\}$		M1 subst ^y of $(1 - \sin^2 x)$ M1 quadratic eq ₂ M1 solving M1 A1 B7 A1 B7 A1 B7 A1

12.	a)	<p>$V_w = 680i + 70j$ $= \sqrt{680^2} = 70^2$ $= \sqrt{467300}$ $= 683.59 \text{ kmhr}^{-1}$</p> <p>$\theta = \tan^{-1}\left(\frac{70}{680}\right)$ $\theta = 84.12^\circ$</p> <p>The true velocity is 683.59 kmhr^{-1} in the direction of E84.12°N</p>	B1 diagram M1 A1 A1 B1
			05 Marks
b)		$\overline{AB} = \overline{OB} - \overline{OA}$ $= b - a$ $= \begin{pmatrix} 2 \\ 3 \end{pmatrix} - \begin{pmatrix} 3 \\ 1 \end{pmatrix}$ $= \begin{pmatrix} -1 \\ 2 \end{pmatrix}$ $= -i + 2j$ $\overline{CB} = \overline{OB} - \overline{OC}$ $= \begin{pmatrix} 2 \\ 3 \end{pmatrix} - \begin{pmatrix} 5 \\ -4 \end{pmatrix}$ $= \begin{pmatrix} -3 \\ 7 \end{pmatrix} \rightarrow -3i + 7j$	M1 A1 M1 A1
			04 Marks
ii)		<p>$\overline{AB} \cdot \overline{BC} = \overline{AB} \overline{BC} \cos \theta$ $\begin{pmatrix} -1 \\ 2 \end{pmatrix} \begin{pmatrix} 3 \\ -7 \end{pmatrix} = \sqrt{(-1)^2 + 2^2} \cdot \sqrt{3^2 + (-7)^2} \cos \theta$ $-3 - 14 = \sqrt{5} \sqrt{68} \cos \theta$ $\frac{-17}{\sqrt{290}} = \cos \theta$ $\theta = \cos^{-1}\left(\frac{-17}{\sqrt{290}}\right)$ $= 176.6^\circ$</p> <p>$\overline{AB} \cdot \overline{CB} = \overline{AB} \overline{CB} \cos \theta$ $\begin{pmatrix} -1 \\ 2 \end{pmatrix} \begin{pmatrix} 5 \\ -4 \end{pmatrix} = (BA) BC \cos \theta$</p>	M1 B1 A1
			03 Marks
	iii)	$AC = OC - OA$	

$$= \begin{pmatrix} 5 \\ -4 \end{pmatrix} - \begin{pmatrix} 3 \\ 1 \end{pmatrix}$$

$$= \begin{pmatrix} 2 \\ 5 \end{pmatrix}$$

Midpoint:

$$\overrightarrow{AC} = OC - OA$$

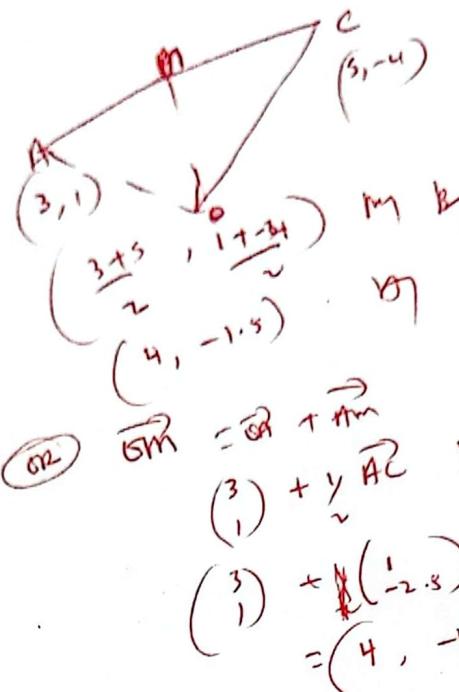
$$= \begin{pmatrix} 5 \\ -4 \end{pmatrix} - \begin{pmatrix} 3 \\ 1 \end{pmatrix}$$

$$= \begin{pmatrix} 2 \\ 5 \end{pmatrix}$$

$$\frac{1}{2} \begin{pmatrix} 2 \\ 5 \end{pmatrix}$$

$$= \begin{pmatrix} 1 \\ -2.5 \end{pmatrix}$$

$$= i - 2.5j$$



M1

B1

A1

03 Marks

13. i)

$$Px = \frac{P_n}{P_o} \times 100$$

$$\text{For bread, } Px = \frac{1500}{525} \times 100$$

$$= 285.7$$

After 1 dp

B1

$$\text{For Rice, } Px = \frac{2500}{2000} \times 100$$

$$= 125$$

B1

$$\text{For Beans, } Px = \frac{1800}{1500} \times 100$$

$$= 120$$

B1

$$\text{For sorghum, } Px = \frac{1500}{1200} \times 100$$

$$= 125$$

B1

$$\text{For water, } Px = \frac{450}{300} \times 100$$

$$= 150$$

B1

$$\text{SAPI} = \frac{\sum P_{2008}}{\sum P_{2005}} \times 100$$

B1

$$= \frac{1500+2500+1800+1500+450}{52.5+2000+1500+1200+300} \times 100$$

M1 M1 M1

$$= \frac{7750}{5525} \times 100$$

M1

$$= 140.3$$

A1

VII(8) 1 dp

10 Marks

$$\text{ii) WAPI} = \frac{\sum \left(\frac{P_n}{P_o} \times W \right)}{\sum W} \times 100$$

$$= \frac{(1500 \times 3) + (2500 \times 5) + (1800 \times 1) + (1500 \times 2) + (450 \times 4)}{166.75} \times 100$$

$$= \frac{23600}{166.75} \times 100$$

$$= 141.53 \text{ By}$$

$$\begin{aligned}
 &= \left(\frac{1500}{525} \times 3 \right) + \left(\frac{2500}{2000} \times 5 \right) + \left(\frac{1800}{1500} \times 1 \right) + \left(\frac{1500}{1200} \times 2 \right) + \left(\frac{450}{300} \times 4 \right) \times 100 \\
 &= \frac{8.57 + 6.25 + 1.2 + 2.5 + 6}{15} \times 100 \\
 &= 163.5
 \end{aligned}$$

There was an increment of 63.5%

M1
M1
M1
A1

B1

05 Marks

14.

M	C	Rm	Rc	d	d^2
50	46	6	4	2	4
35	26	9	10	-1	1
55	48	5	3	2	4
60	44	4	5	-1	1
85	62	2	1	1	1
25	28	10	9	1	1
65	30	3	8	-5	25
90	60	1	2	-1	1
45	34	7	7	0	0
40	42	8	6	2	4

$$\begin{aligned}
 \sum d^2 &= 42 & m & m & m & k \\
 f &= 1 - \frac{6 \sum d^2}{n(n^2 - 1)} & m & m & m & \\
 &= 1 - \frac{6 \times 42}{10(10^2 - 1)} & m & m & m & \\
 &= 0.746 & m & m & m &
 \end{aligned}$$

B1

B1

B1

M1 M1

A1

06 Marks

Comment: A positive moderate correlation

B1

15.

a) For Pdf, $\int f(y)dy = 1$

$$\begin{aligned}
 &= \frac{1}{4} \int_0^2 y dy + \frac{1}{4} \int_2^4 (4-y) dy \\
 &= \frac{1}{4} \left[\frac{y^2}{2} \right]_0^2 + \frac{1}{4} \left[4y - \frac{y^2}{2} \right]_2^4 \\
 &= \frac{1}{4} \left[\frac{4}{2} - 0 \right] + \frac{1}{4} [(16-8)-(8-2)] \\
 &= \frac{1}{4}[2] + \frac{1}{4}[8-6] \\
 &= \frac{4}{4} \\
 &= 1
 \end{aligned}$$

M1

M1

B1 M1

A1

04 Marks

b) i) Mean $E(y) = \int yf(y)dy$

$$= \frac{1}{4} \int_0^2 y^2 dy + \frac{1}{4} \int_2^4 y(4-y) dy$$

M1

	$= \frac{1}{4} \int_0^2 y^2 dy + \frac{1}{4} \int_2^4 (4y - y^2) dy$ $= \frac{1}{4} \left[\frac{y^3}{3} \right]_0^2 + \frac{1}{4} \left[\frac{4y^2}{2} - \frac{y^3}{3} \right]_2^4$ $= \frac{1}{4} \left[\frac{8}{3} \right] + \frac{1}{4} \left[\left(32 - \frac{64}{3} \right) - \left(8 - \frac{8}{3} \right) \right]$ $= \frac{2}{3} + \frac{1}{4} \left[\frac{16}{3} \right]$ $= = \frac{6}{3} = 2$	BT M1 BT M1 A1
		04 Marks
	iii) $\text{Var}(y) =$ $= \frac{1}{4} \int_0^2 y \cdot y^2 dy + \frac{1}{4} \int_2^4 y^2 (4-y) dy$ $= \frac{1}{4} \int_0^2 y^3 dy + \frac{1}{4} \int_2^4 4y^2 - y^3 dy$ $= \frac{1}{4} \left[\frac{y^4}{4} \right]_0^2 + \frac{1}{4} \left[\frac{4y^3}{3} - \frac{y^4}{4} \right]_2^4$ $= \frac{1}{4} \left[\frac{16}{4} - 0 \right] + \frac{1}{4} \left[\left(\frac{256}{3} - \frac{256}{4} \right) - \left(\frac{32}{3} - \frac{-16}{4} \right) \right]$ $= \frac{1}{4} [4] + \frac{1}{4} \left[\frac{64}{3} - \frac{-20}{3} \right]$ $= 1 + \frac{1}{4} \left[\frac{44}{3} \right]$ $= 1 + \frac{11}{3}$ $= \frac{14}{3} - 2^2 = \frac{14}{3} - 4 = \frac{2}{3} \approx 0.667 \nearrow$	M1 Integ. B1 Substn B1 A1
		04 Marks
	iii) $P(y < 1) = \frac{1}{4} \int_0^1 y dy$ $= \frac{1}{4} \left[\frac{y^2}{2} \right]_0^1$ $= \frac{1}{4} \left[\frac{1}{2} - 0 \right]$ $= \frac{1}{4} \left[\frac{1}{2} \right]$ $= \frac{1}{8}$	M1 Integ. M1 Substn A1
		03 Marks
16.	a)i) $P(x < 145)$ $= P(Z < \frac{145-150}{30})$ $P(Z < -0.167)$ $0.5 - P(0 < Z < 0.167)$	M1 B1 M1

$$= 0.5 - 0.0663$$

$$= 0.4337$$

$$\text{ii) } P(x > 170)$$

$$= P\left(Z > \frac{170-150}{30}\right)$$

$$= P(Z > 0.667)$$



$$0.5 - P(0 < Z < 0.667)$$

$$0.5 - 0.2476$$

$$= 0.2524$$

A1
04 Marks

M1
B1

M1

A1
04 Marks

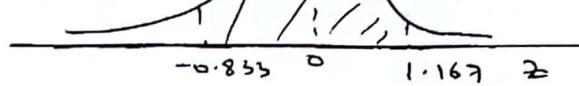
M1 M1

B1 B1

$$\text{iii) } P(125 < x < 185)$$

$$= P\left(\frac{125-150}{30} < Z < \frac{185-150}{30}\right)$$

$$= P(-0.833 < Z < 1.167)$$



$$= \Phi(0.833) + \Phi(1.167)$$

$$= 0.2976 + 0.3784$$

$$= 0.6760$$

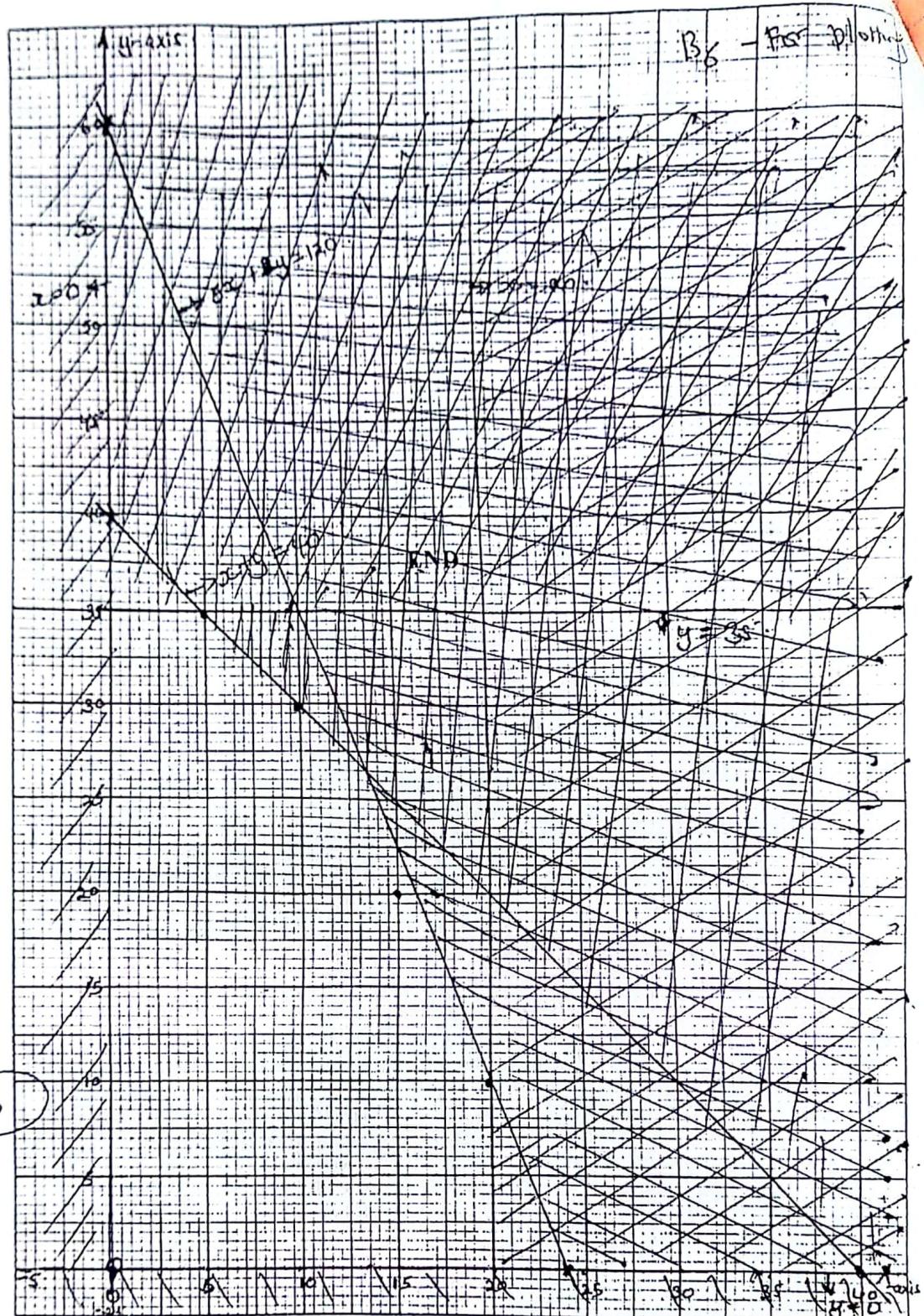
M1

M1

A1

07 Marks

10. (c)



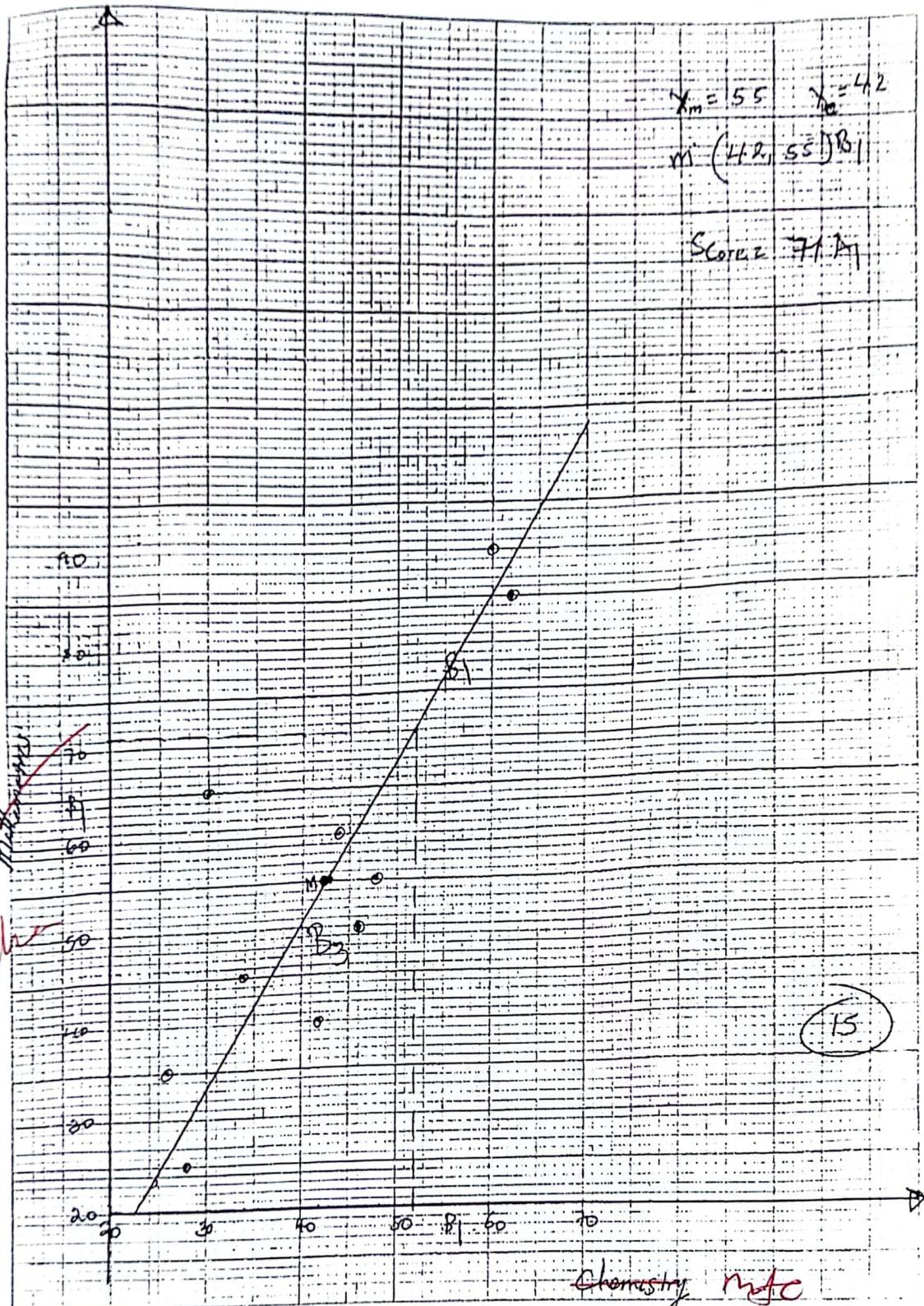
B₁ - for each 4 points lines drawn & shaded

B₂ - for feasible region

B₃ - shading non zero inc

14. (b)

(16) b



END