TOPIC:

CIRCULAR MEASURES

Q12:

(a) $\angle$ AOD = $\angle$ DOC = 60°

$\theta = 360° - 120° = 240°$

$= \dfrac{120° \times 3.142}{180°} = 4.189$ rad. √ A1

√ K1

(b) $209\frac{7}{15} = \frac{1}{2} r^2 (4.189)$ → use area of major sector OAC

r (OA or OC) $= \sqrt{\dfrac{2(209\frac{7}{15})}{4.189}} = 10$ √ A1

(c) Perimeter shaded region

= OA + OC + Major S_{AC} √ M1

OA and OC = 10 → from (b)

used $s = r\theta$

S_{AC} = 10 (4.189) √ K1 √ M1

Perimeter = 10 + 10 + 41.89 = 61.89 √ A1

(d) Area segment ABC

used $A = \frac{1}{2} r^2\theta$ used $A = \frac{1}{2} r^2 \sin\theta$

= Area Sector OABC – Area △OAC √ M1

$= \frac{1}{2} (10)^2 \left(\frac{120^\circ \times 3.142}{180^\circ}\right) - \frac{1}{2} (10)^2 \sin 120^\circ$ √ M1

√ K1 √ K1 either one

= 61.43 √ A1

Q13:

(a) AP = ¾ (8) = 6 cm √ K1

(b) Perimeter shaded region = AP + AB + BQ + S_{PQ} √

AB = $8 \sin \frac{\pi}{6}$ = 4 cm √ K1

BQ = $14 - 8 \cos \frac{\pi}{6}$ = 7.072 cm √ K1

$S_{PQ} = 14(\frac{\pi}{6})$ = 7.331 cm √ K1

M1

∴ Perimeter shaded region = 24.40 cm √ A1

(6 + 4 + 7.072 +7.331 = 24.403)

(c) Area shaded region

= Area sector POQ – Area $\triangle$OAB $\surd$ M1

Area sector POQ = $\frac{1}{2}(14)^2 \frac{\pi}{6} = 51.32$ $\surd$ K1

Area $\triangle$OAB = $\frac{1}{2}(4)(8\cos\frac{\pi}{6}) = 13.85$ $\surd$ K1

$\therefore$ Area shaded region = 51.32 – 13.85 $\surd$ M1

= 37.46 cm^2 $\surd$ A1

TOPIC:

LINEAR LAW

Q14: Section B

√ M1

(a)

X	3	4	5	6	7	8
$\log_{10} y$	0.41	0.52	0.61	0.69	0.80	0.90

√ A1

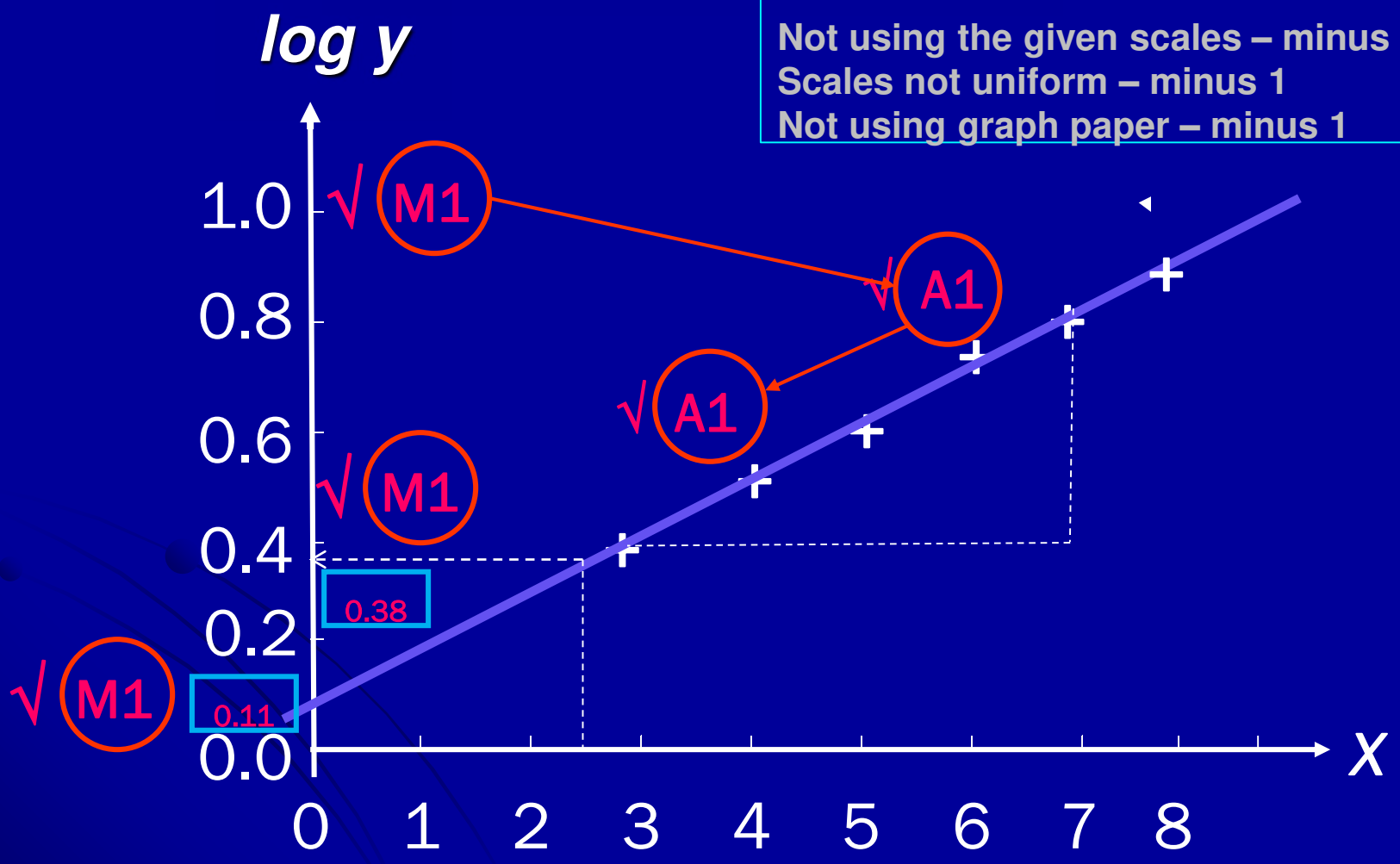
✓ The value of log y must be ≥ 2 decimal places

✓ If the table is not shown, the A1 mark can be given on/to all the points plotted correctly on the graph

Q14: samb…

Graph log y against x

Not using the given scales – minus 1
Scales not uniform – minus 1
Not using graph paper – minus 1



Q14: samb…

(b) Plot $\log_{10} y$ against x

(correct axes and uniform scales) √ M1

6 points plotted correctly √ A1

Line of best fit √ A1

Linear the equation :

√ K1 $\log_{10} y = x \log_{10} h - \log_{10}$

(c) (i) $gradient = \log_{10} h = 0.098$ √M1

$h = 1.253$ √A1

(ii) $\log_{10} y$- $intercept = - \log_{10} k = 0.11$ √M1

$\log_{10} k = - 0.11$

√ M1 $k = 0.7762$ √A1

(iii) $x = 2.7$; $\log y = 0.38$, √A1

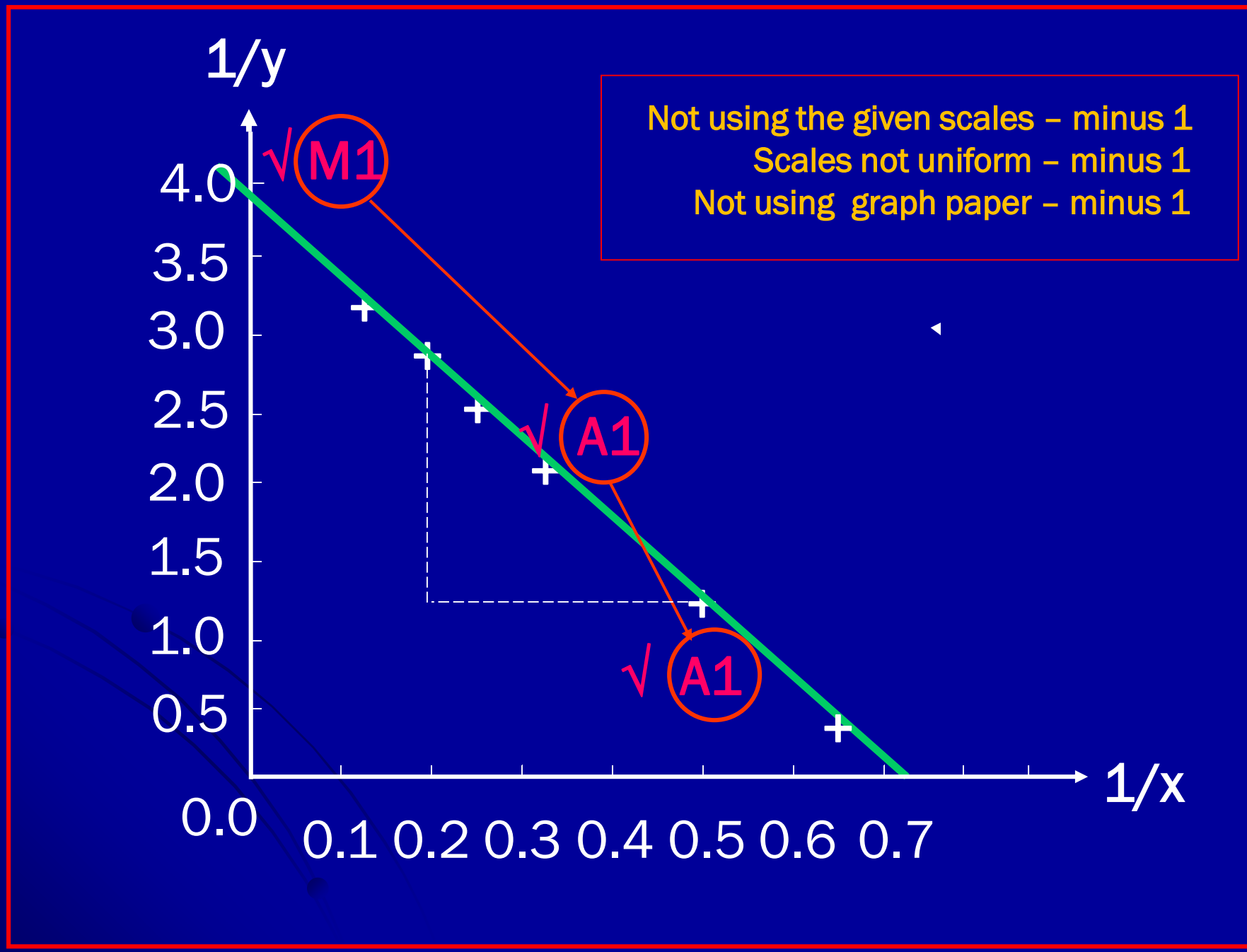
$y = 2.399$

Q15: Section B

$\frac{1}{x}$	0.67	0.50	0.33	0.25	0.20	0.17	√A1
$\frac{1}{y}$	0.40	1.30	2.15	2.60	2.85	3.05	√A1

✓ The value of *1/y* and *1/x* must be ≥ 2 decimal places

✓ If the table is not shown, the A1 mark can be given on/to all the points plotted correctly on the graph


1/y
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.1 0.2 0.3 0.4 0.5 0.6 0.7
1/x
√ M1
√ A1
√ A1
Not using the given scales – minus 1
Scales not uniform – minus 1
Not using graph paper – minus 1

(b) **Plot $\log_{10} y$ against x**

(correct axes and uniform scales) √ M1

6 points plotted correctly √ A1

Lines of best fit √ A1

(c) ***1/y = (p/k)(1/x) + 1/k*** √ K1

(i) **1/k-intercept = 0.39** √ M1

k = 1/3.9 = 0.26 √ A1

(ii) ***gradient, m = p/k***

= (2.85 **– 0.40 / (0.20 – 0.67)** √ M1

p = – 1.34 √ A1

TOPIC:

COORDINATE GEOMETRY

Q16: Section B

(a)(i) Equation BC: $2y + x + 6 = 0$

$y = -\frac{1}{2}x - 3$

Gradient, $m_{BC} = -\frac{1}{2}$ ==> $m_{AB} = 2$ √ M1

Equation AB: $y - 9 = 2(x + 4)$ √ K1

$y = 2x + 17$ √ A1

(a)(ii) $2y + x + 6 = 0$ .....(1)

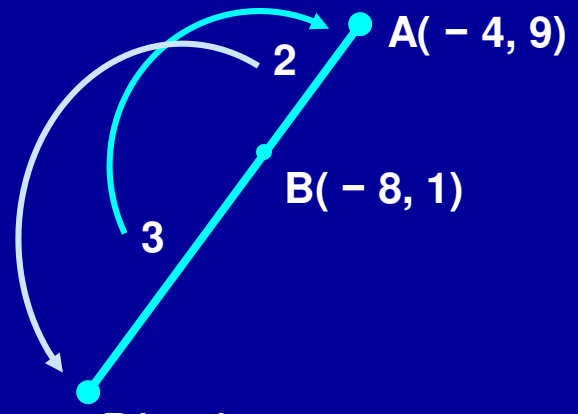
$y = 2x + 17$ .....(2)

(2)→(1): $2(2x + 17) + x + 6 = 0$ √ M1

$x = -8;\ y = 1$

$\therefore$ B (−8, 1) √ A1

(b)



$$-8 = \frac{2(x) + 3(-4)}{2+3} \Rightarrow x = -14$$

$$1 = \frac{2(y) + 3(9)}{2+3} \Rightarrow y = -11$$

either one √ M1

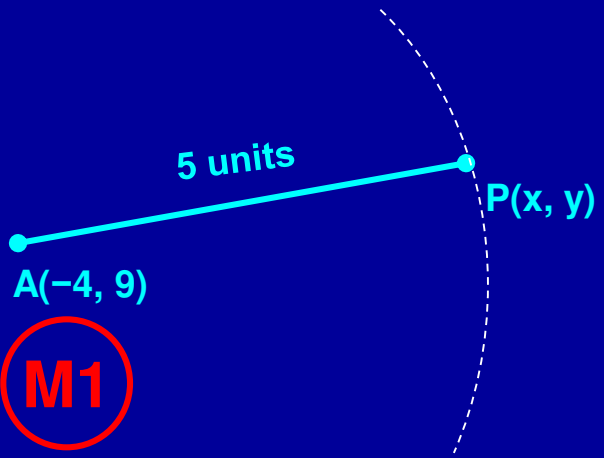
$\therefore$ D (−14, −11) √ A1

(c) PA = 5, Let P(x, y),

$$\sqrt{(x+4)^2 + (y-9)^2} = 5 \quad \surd \text{ M1}$$

$$x^2 + 8x + 16 + y^2 - 18y + 81 = 25 \quad \surd \text{ M1}$$

$$x^2 + y^2 + 8x - 18y + 72 = 0 \quad \surd \text{ A1}$$



TOPIC:

LINEAR PROGRAMMING

Q17: Section C

(a) I : $x + y \leq 100$ √ K1

II : $y \leq 4x$ √ K1

III : $y - x \geq 5$ √ K1

Note:
If given > 3 inequalities
or
No equal sign on all the inequalities
- minus 1 mark

(b) Lukis garis-garis lurus graf

(Guna kaedah dua titik)

I : $x + y = 100$

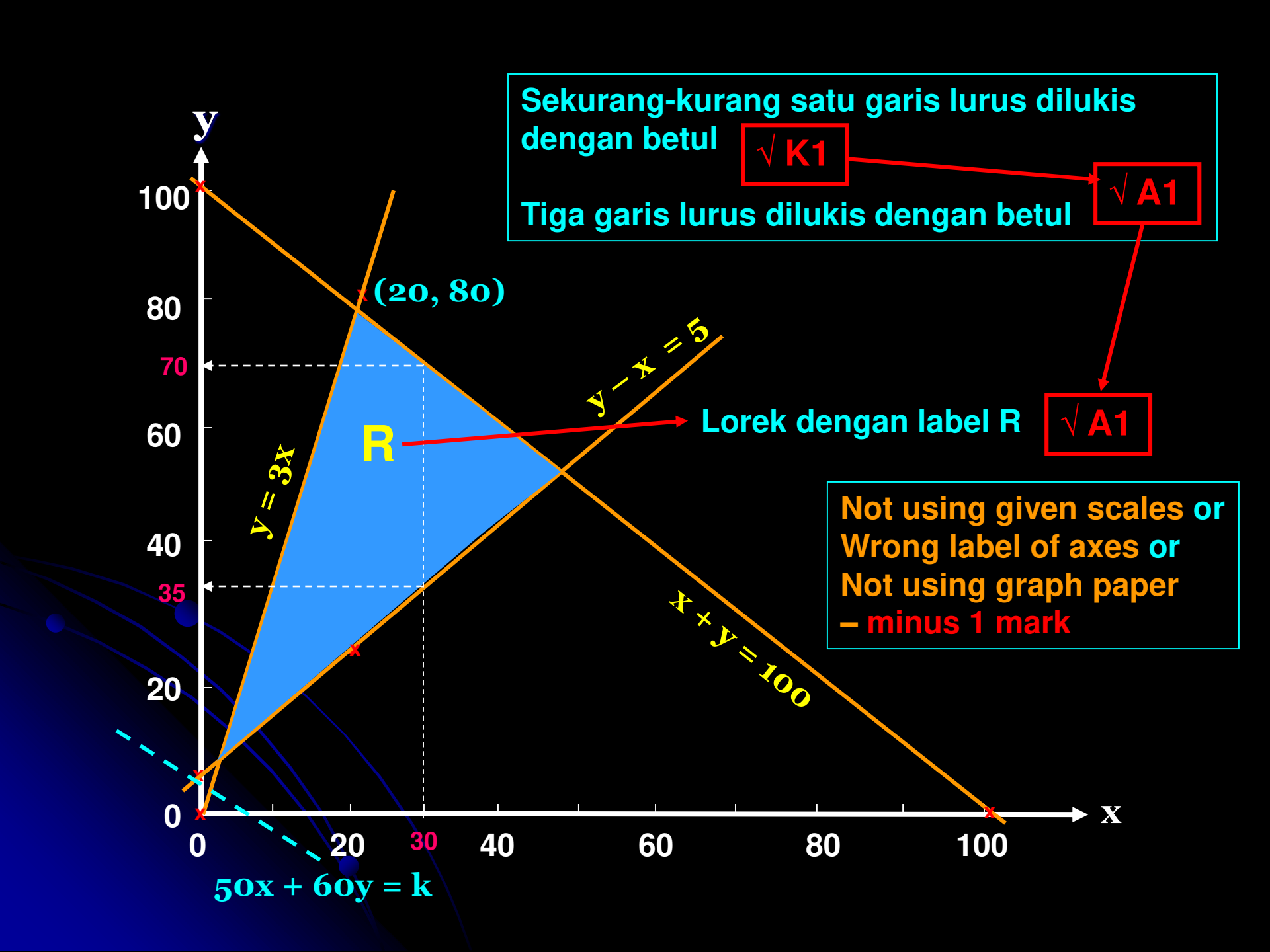
X	0	100
y	100	0

II : $y = 4x$

X	0	20
Y	0	80

III : $y - x = 5$

X	0	20
y	5	25


Sekurang-kurang satu garis lurus dilukis dengan betul
√ K1
√ A1
Tiga garis lurus dilukis dengan betul
√ A1
Lorek dengan label R
Not using given scales or
Wrong label of axes or
Not using graph paper
– minus 1 mark
y
x
100
80
70
60
40
35
20
0
0
20
30
40
60
80
100
(20, 80)
R
y = 3x
y – x = 5
x + y = 100
50x + 60y = k

(C)(i) From graph drawn (shown by extrapolation method on the feasible region):

Range = $35 < y < 70$ √ A1

(ii) Objective function:

√ M1

$50x + 60y = k$

Maximum point = (20, 80) √ A1

Maximum fees:

$50(20) + 60(80) = RM5,800$ √ A1

Q18: Section C

(a) I : $60x + 20y \leq 720$

$3x + y \leq 36$ √ K1

II : $30x + 40y \geq 360$

$3x + 4y \geq 36$ √ K1

III : $x/y \geq 1/3$

$3x \geq y$ or $y \leq 3x$ √ K1

(b) Lukis garis-garis lurus graf

(Guna kaedah dua titik)

I : $3x + y = 36$

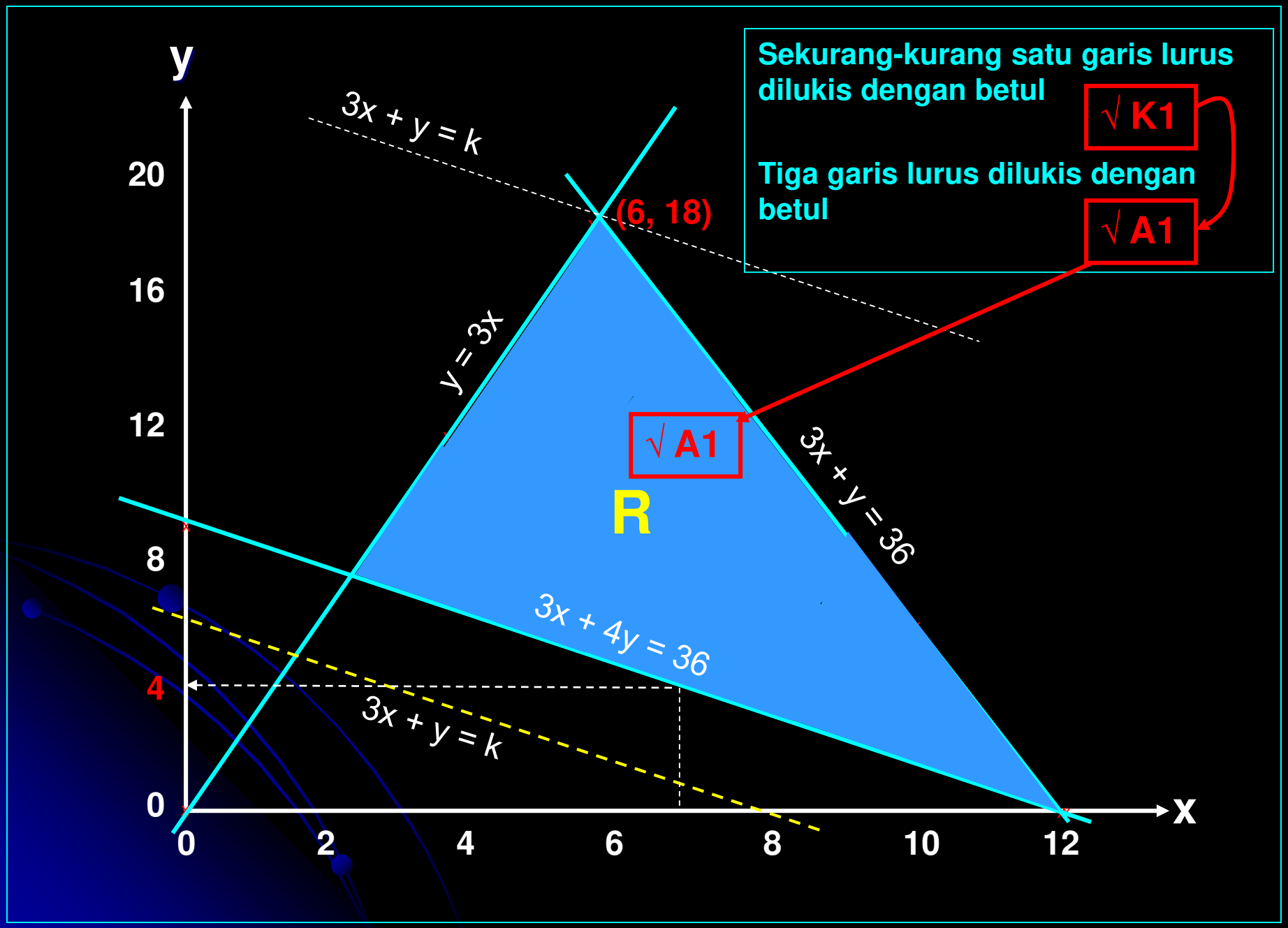
X	10	12
y	6	0

II : $3x + 4y = 36$

X	0	12
y	9	0

III : $y = 3x$

X	0	6
y	0	18


y
x
20
16
12
8
4
0
0
2
4
6
8
10
12
3x + y = k
(6, 18)
y = 3x
3x + y = 36
3x + 4y = 36
3x + y = k
R
√ A1
Sekurang-kurang satu garis lurus dilukis dengan betul
√ K1
Tiga garis lurus dilukis dengan betul
√ A1

C(i) When x = 7, y = 4

Minimum number of racks type Q per day = 4 √ A1

√ M1

(ii) Objective function: 24x + 32y = k

Maximum point = (6, 18) √ A1

Maximum profit = 24(6) + 32(18)

= RM720.00 √ A1

TOPIC:

INDEX NUMBERS

Q19: Section C

(a)(i) $\dfrac{37.70}{P_{S/93}} \times 100 = 130$ √ M1

Use formula: $I = \dfrac{P_1}{P_0} \times 100$

$P_{S/93} = 29.00$ √ A1

OR

(ii) $\dfrac{P_{P/95}}{P_{P/91}} \times 100 = \dfrac{P_{P/95}}{P_{P/93}} \times \dfrac{P_{P/93}}{P_{P/91}} \times 100$ √ M1

$\dfrac{P_{P/95}}{P_{P/93}} = \dfrac{135}{100}$

$\dfrac{P_{P/93}}{P_{P/91}} = \dfrac{120}{100}$

$= \dfrac{135}{100} \times \dfrac{120}{100} \times 100$ √ M1

$= 162$ √ A1

(b)(i)

Item	I	W	IW
P	135	40	5400
Q	x	30	30x
R	105	10	1050
S	130	20	2600
$\sum$		100	9050 + 30x

√ K1

Use formula:

$$\bar{I} = \frac{\sum IW}{\sum W}$$

$$\frac{9050 + 30x}{100} = 128$$

√ M1

$x = 125$ √ A1

(ii)

$$\frac{Q_{95}}{Q_{93}} \times 100 = 128$$

➔

$$Q_{93} = \frac{100}{128} \times 32$$

√ M1

$Q_{93} = 25$ √ A1

Q20: Section C

Use formula:

$$I = \frac{P_1}{P_0} \times 100$$

(a)

$$x = \frac{1.00}{0.80} \times 100 = 125$$

√ A1

$$\frac{y}{2.00} \times 100 = 140 \implies y = \frac{140}{100} \times 2.00 = 2.80$$

√ A1

$$\frac{0.40}{z} \times 100 = 80 \implies z = \frac{0.40}{80} \times 100 = 2.80$$

√ A1

(b)(i)

Item	I	W	IW
P	125	80	10 000
Q	140	120	16 800
R	150	100	15 000
S	80	60	4 800
∑		360	46 600

$$\bar{I} = \frac{46600}{360}$$

√ M1

= 129.44

√ A1

√ K1

Use formula:

$$\bar{I} = \frac{\sum IW}{\sum W}$$

Use formula:

$$I = \frac{P_1}{P_O} \times 100$$

(b)(ii) $$\frac{2\,985}{Q_{2001}} \times 100 = 129.44$$

√ M1

$$Q_{2001} = \frac{2\,985}{129.44} \times 100$$

= 2 306 09 √ A1

(c) $$\frac{Q_{2007}}{Q_{2004}} = \frac{150}{100}$$ and $$\frac{Q_{2004}}{Q_{2001}} \times 100 = 129.44$$

$$\frac{Q_{2007}}{Q_{2001}} \times 100 = \frac{Q_{2007}}{Q_{2004}} \times \frac{Q_{2004}}{Q_{2001}} \times 100$$

$$= \frac{150}{100} \times 129.44$$

= 194.16 √ A1

√ M1