MATHEMATICS PAPER 2

2026 CWED MOCK MARKING KEY

1. a. $= \frac{x^2+x-2}{(x-1)^2} \times \frac{xy-y}{x^2+2x} = \frac{(x+2)(x-1)}{(x-1)(x-1)} \times \frac{y(x-1)}{x(x+2)} = \frac{y}{x}$ M1 M1 M1 A1

   b.$= \frac{8-3\sqrt{2}}{4+3\sqrt{2}} \times \frac{4-3\sqrt{2}}{4-3\sqrt{2}} = \frac{32-24\sqrt{2}-12\sqrt{2}+18}{16-18} = \frac{50-36\sqrt{2}}{-2} = -25+18\sqrt{2}$ M1 M1 M1

   $\therefore\ a = -25\ and\ b = 18$ A1 A1

2. a. $\overrightarrow{AB} = \begin{pmatrix} 2a \\ -3a \end{pmatrix} - \begin{pmatrix} a \\ -2a \end{pmatrix} = \begin{pmatrix} a \\ -2a \end{pmatrix} = a\begin{pmatrix} 1 \\ -2 \end{pmatrix}$ M1 M1

   $\overrightarrow{BC} = \begin{pmatrix} \mu a \\ -7a \end{pmatrix} - \begin{pmatrix} 2a \\ -3a \end{pmatrix} = \begin{pmatrix} \mu a-2a \\ -4a \end{pmatrix} = a\begin{pmatrix} \mu-2 \\ -4 \end{pmatrix} = 2a\begin{pmatrix} \frac{\mu-2}{2} \\ -2 \end{pmatrix} = 2\overrightarrow{AB}$ M1

   $\therefore\ \frac{\mu-2}{2} = 1$ M1

   $\mu = 4$ A1

   b. $\log_3(4x+1) - \log_3(2x)^2 = 1$

   $\log_3 \frac{4x+1}{4x^2} = 1$ M1

   $4x+1 = 12x^2$ M1

   $12x^2 - 4x - 1 = 0$ M1

   $(2x-1)(6x+1) = 0$ M1

   $x = \frac{1}{2}$ A1 as negative solution is rejected

3. a. let the terms be $a, a+d, a+2d$ or $a-d, d, a+d$

   Sum: $a-d+a+a+d = 6$ M1

   $3a = 6$ M1

   $a = 2$

   Product: $(a-d)a(a+d) = -64$ M1

   $(2-d)(2)(2+d) = -64$

   $8+4d-4d-2d^2 = -64$

   $8-2d^2 = -64$

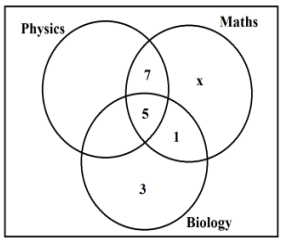
   $-2d^2 = -72$

   $d^2 = 36$ M1

   $d = \sqrt{36} = 6$ M1

   Terms are 2, 8, 14 A1

b.



M1 for either 1 or 7

M1 for 3 or x

A1

4. a. i. $AC^2 = 4^2 + 4^2 = 32$ M1

$AC = \sqrt{32} = 4\sqrt{2}$ A1

ii.

$\cos\theta = \frac{2\sqrt{2}}{4}$ M1

$\theta = \cos^{-1}\left(\frac{2\sqrt{2}}{4}\right) = 45^o$ M1 A1

b. let x + 2 = 0 x = -2

$f(-2) = (-2)^3 - 3(-2) + t = 0$ M1

-2 + t = 0

t = 2 M1

using synthetic method

-2	1	0	-3	2
		-2	4	-2
	1	-2	1	0

M1

M1

$f(x) = (x + 2)(x^2 - 2x + 1)$ M1

$= (x + 2)(x - 1)(x - 1)$ A1

5. a. $y = (x + 4)(x - k) = x^2 + (4 - b)x - 4k$ M1 M1

$at\ x = -1 \quad x = -\frac{b}{2a}$

$-1 = -\frac{4-k}{2(1)}$

$-2 = -4 + k$

$k = 2$ M1

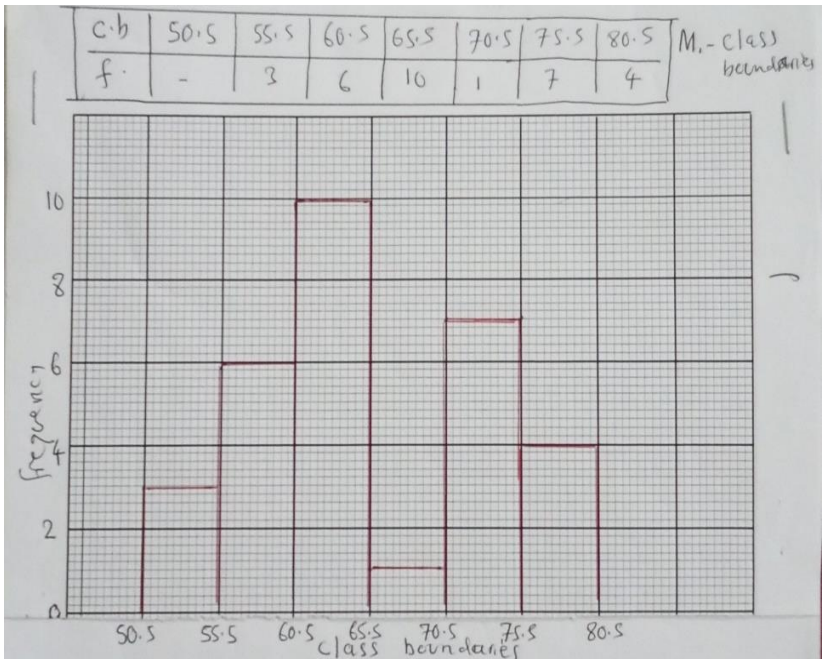
$equ \quad y = a(x^2 + 2x - 8)$

$-8a = 8$ M1

$a = -1$

$\therefore equ \quad y = -x^2 - 2x + 8$ A1

b.



M1 – scale on y – axis

M1 – joining bars

A1

6. a. <ABC = 90° AB is diameter M1

<BCD = 90° adja <s

<BCE = < BAC M1

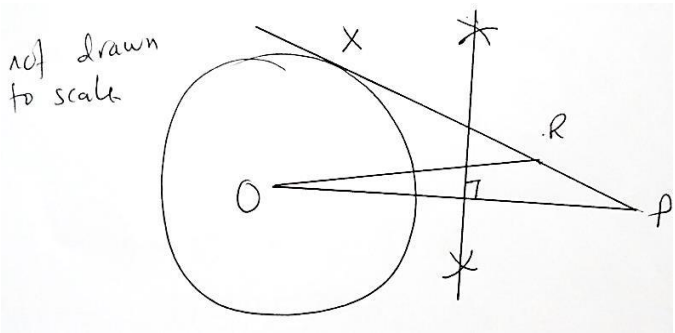
<ABC + <BCE = 90° M1

Also <BCE + <ECD = 90°

<ABC + <BCE + <BCE + <ECD M1

<ABC + <ECD A1

b.



M1 circle
M1 point P
M1 bisection
M1 tangent
A1 correct angle

Section B(40 marks)

7. $C = k + k_1PD$ M1

$129000 = k + k_1(5)(10)$ M1 M1

$129000 = k + 50k_1$ .....(1)

$146000 = k + 84k_1$ .....(2)

Equ (1) – (2) M1

$17000 = 34k_1$ M1

$K_1 = 500$

$129000 = k + 25000$

$K = 104000$ M1

relationship $C = 104000 + 500PD$ M1

$C = 104000 + 500(8)(15)$ M1

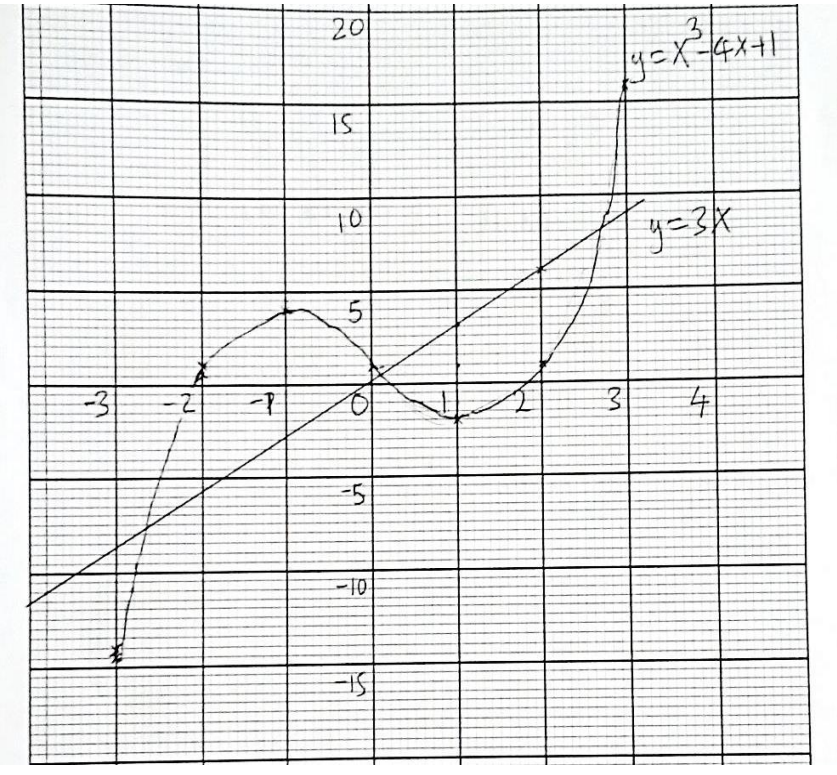
$= K164000$ M1 A1

8. i.

X	-3	-2	-1	0	1	2	3
Y	-14	1	4	1	-2	1	16

A1

ii.



iii. $y = x^3 - 4x + 1 - (x^3 - 7x + 1)$

$y = 3x$ M1

$x = -2.7,\ 0.2\ and\ 2.5\ \pm 0.1$ A1 A1 A1

9. i. $\overrightarrow{AB} = \overrightarrow{AO} + \overrightarrow{OB} = -\underline{a} + \underline{b}$ M1 M1

$AP = \frac{2}{3}(\underline{b} - \underline{a}) = \frac{2}{3}\underline{b} - \frac{2}{3}\underline{a}$ M1

$\overrightarrow{MP} = \frac{1}{2}\underline{a} + \frac{2}{3}\underline{b} - \frac{2}{3}\underline{a} = \frac{1}{6}\underline{a} + \frac{2}{3}\underline{b}$ M1 M1

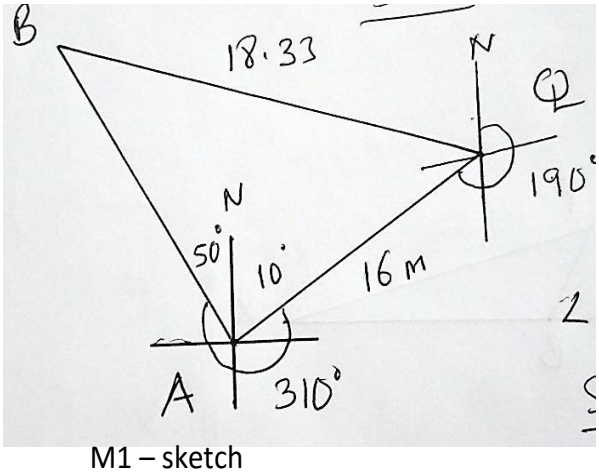
$\overrightarrow{MX} = \frac{1}{2}\underline{a} + 2\underline{b}$ M1 A1

ii. $\overrightarrow{MP} = \frac{1}{3}\left(\frac{1}{2}\underline{a} + 2\underline{b}\right) = \frac{1}{3}\overrightarrow{MX}$ M1 M1

$\therefore \overrightarrow{MP} is\ //to\ \overrightarrow{MX}$ M is common point.

Points M, P and X are collinear

10.



M1 – sketch

<BAQ = 60° M1

$\frac{\sin\theta}{16} = \frac{\sin 60}{18.33}$ M1

$\sin\theta = \frac{\sin 60 \times 16}{18}$ M1

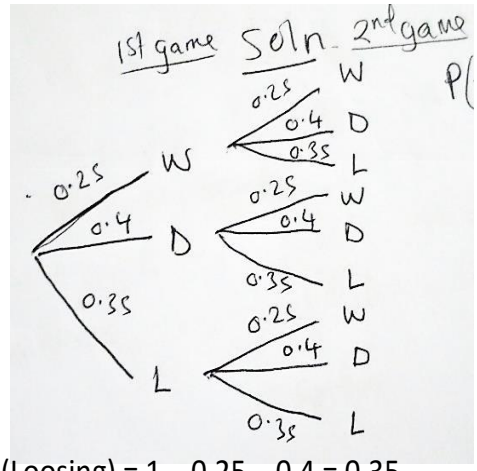
$\theta = \sin^{-1}(\frac{16\sin 60}{18}) = 49.1$ M1 M1

$< BOA = 180 - (49.1 + 60) = 70.9$ M1

$\frac{d}{\sin 70.9} = \frac{18.33}{\sin 60}$ M1

$d = \frac{18.33 \times \sin 70.9}{\sin 60} = 20m$ A1

11. a.



P(Loosing) = 1 – 0.25 – 0.4 = 0.35 M1

M1 - three outcome branches

M1 - one correct path

M1 - path for LL

b. P(1W) = P(WD) + P(WL) + P(DW) + P(LW) M1

= (0.25)(0.4) + (0.25)(0.35) + (0.4)(0.25) + (0.35)(.025) M1

= 0.1 + 0.0875 + 0.1 + 0.0875 M1

= 0.375 M1 A1

12. a. $x + y \leq 250$ M1

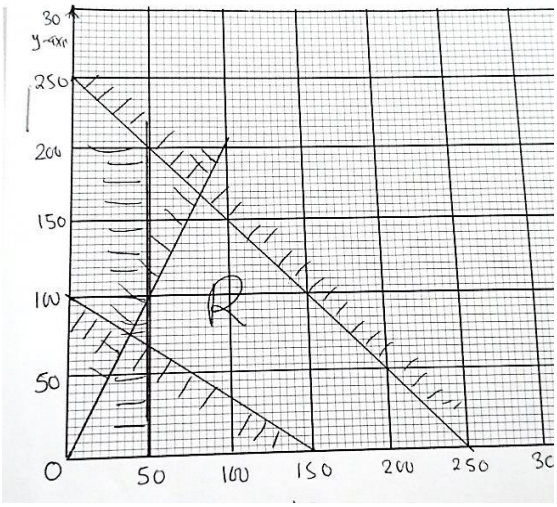
$10{,}000x + 16000y \geq 1{,}600{,}000$

$5x + 8y \geq 800$

$x \leq 200$

$x \geq \frac{1}{2}y$ M1 last inequality A1

b.



M1 – scale

M1 – Line in single variable

M1 – line in two variables

A1

c. income of tickets = 10000x + 16000y

when y = 140 x = 110

therefore income of tickets = 10000(110) + 16000(140) M1 M1

= K3,340,000 A1