



香港考試及評核局
Hong Kong
Examinations and
Assessment Authority

Briefing session on 2021 HKDSE Mathematics Extended Part Module 2

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General marking guidelines

- 'M' marks
for correct method with substitution
- 'A' marks
for correct answer that follows from the steps
- '1'
for correctly completing a proof or arriving at a given answer
- f.t.
stands for 'follow through', all related parts should be correct to be given this mark

Common mistakes

- Candidates missed 'dx' in the integration, thus giving wrong expressions like $\int_a^b f(x)$
- Candidates should use brackets appropriately, missing brackets would result in different meanings:

$$(\ln x)^2 \text{ vs } \ln x^2$$

$$\frac{d}{dx} \left(x + 1 - \frac{x-2}{(x-1)^2} \right) \text{ vs } \frac{d}{dx} x + 1 - \frac{x-2}{(x-1)^2}$$

Question 1

- Some candidates did not show the elimination of h properly.

Question 2

- A small number of candidates used inaccurate wordings such as: “Assume $n = m$ is true for the statement”; “the statement is true for **all** integers n .”
X
- A small number of candidates used wrong symbols such as $\sum_{k=1}^{k+1}(3k^5 + k^3)$ or $\sum_{k=1}^{m+1}(3m^5 + m^3)$.

Question 5

Part (a)

- Some candidates wrongly stated that $x + 1$, instead of $y = x + 1$, is an oblique asymptote.

Part (c)

- Some candidates failed to show that $\frac{d^2}{dx^2} r(x)$ changes sign at the point of inflexion.

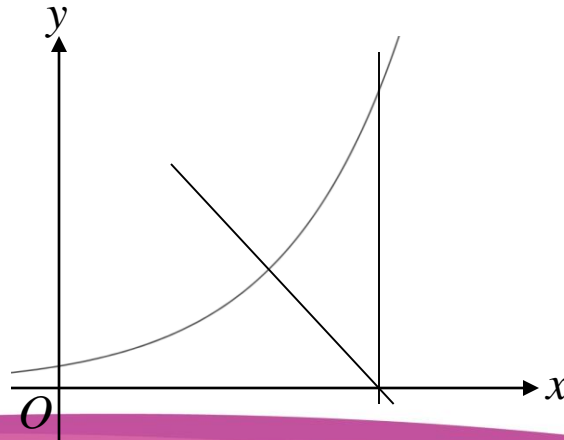
Question 6

Part (a)

- A small number of candidates wrongly took the y -intercept as c .

Part (b)

- Some candidates used wrong upper or lower limits, e.g, from 0 to c . Also, some candidates wrongly thought that the normal is above the curve for the required bounded region.



Question 7

- Common mistakes found in operations involving logarithm include $(\ln x)^2 = 2(\ln x)$, $(\ln x)^2 = \ln x^2$ and $\frac{d}{dx} \left(\frac{1}{x} \right) = \ln x$.

Question 8

Part (a)

- Some candidates mixed up the notations of determinant and matrix.
- For the case $d = -11$, many candidates did not give any explanation in rejecting this answer.
- For the case $d = 3$, some candidates did not mention that the parameter t in the solution set is a real number.

Part (b)

- Some candidates drew a conclusion without discussing the sign of the value of the discriminant found.
- Some candidates wrongly wrote 'no solution' instead of 'no real solution'.

Question 9

Part (a)(ii)

- Some candidates used wrong relations like $\tan^2 \theta = \sec^2 \theta + 1$.

Part (b)

- Some candidates just stated that $\int_{-a}^a h(x)dx = 2 \int_0^a h(x)dx$ without giving reason or steps, or just wrote $h(x) = h(-x)$ as the reason.

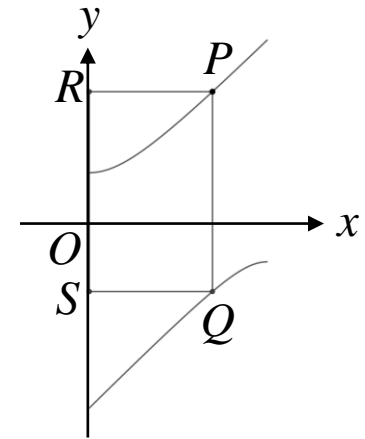
Part (c)

- Some candidates wrongly identified $g(x)$ and $h(x)$.
- Some candidates did not check whether $g(x) + g(-x) = 1$ and $h(x) = h(-x)$ for the $g(x)$ and $h(x)$ they suggested.

Question 10

Part (a)

- Many candidates were unable to express PQ in terms of u . Only some candidates were able to find a using differentiation.
- Some candidates mixed up the variables x , u and a .



Part (b)(i)

- Some candidates wrongly used $A = \frac{u(PQ)}{2}$.
- Some candidates attempted to solve $\frac{dA}{du} = 0$.
- A number of candidates just tested the values of A for $u = 11$ and $u = 12$ only.

Part (b)(ii)

- Most candidates were unable to express OP in terms of u , hence they were unable to use chain rule to find the required rate of change.
- Some candidates wrongly considered $\frac{dOP}{du}$ instead of $\frac{dOP}{dt}$.

Question 11

Part (b)(i)

- Some candidates did not give θ in the correct range $\frac{\pi}{2} < \theta < \pi$.

Part (b)(ii)

- Many candidates were unable to use result of (b)(i) to deduce

$$B = P^{-1} \begin{pmatrix} -2 & 0 \\ 0 & 2 \end{pmatrix} P, \text{ hence they were unable to complete the proof.}$$

Part (b)(iii)

- Most candidates failed to handle $(kM)^{-1}$, where k is a constant and M is a square matrix.
- Some candidates wrongly put $n = -555$ into (b)(ii) .

Question 12

Part (a)(i)

- For parallel vectors, instead of $\frac{12-t}{5} = \frac{-(s+14)}{-4} = \frac{-(2+s)}{-2}$, some candidates wrongly thought that $12-t = 5$, $s+14 = 4$ and $2+s = 2$.

Part (a)(iii)

- Some candidates did not realise that $(\overrightarrow{AB} \times \overrightarrow{AC}) \cdot \overrightarrow{AD}$ may be negative.
- Some candidates used wrong symbols that did not match their calculations. E.g. wrote $\frac{1}{6}(\overrightarrow{AB} \times \overrightarrow{AC}) \times \overrightarrow{AD}$ but calculating $\frac{1}{6}(\overrightarrow{AB} \times \overrightarrow{AC}) \cdot \overrightarrow{AD}$, wrote $\frac{1}{6}\overrightarrow{AD} \cdot |\overrightarrow{AB} \times \overrightarrow{AC}|$ but not calculating the magnitude of $\overrightarrow{AB} \times \overrightarrow{AC}$.

Part (b)

- Only a small number of candidates were able to show properly that E is not the circumcentre of $\triangle ABC$.

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