

Jee Advance 2013

Mathematics Paper- II

PART III - MATHEMATICS

SECTION - 1 : (One or more options correct Type)

This section contains 8 multiple choice questions. Each question has four choices (A), (B), (C) and (D), out of which **ONE or MORE** are correct.

41. In a triangle PQR, P is the largest angle and $\cos P = 1/3$. Further the incircle of the triangle touches the sides PQ, QR and RP at N, L and M respectively, such that the lengths of PN, QL and RM are consecutive even integers. Then possible length(s) of the side(s) of the triangle is(are)

(A) 18 (B) 18 (C) 24 (D) 22

41. (BD) $PM = 2k - 2$, $RL = 2k + 2$, $QN = 2k$
 $PQ = 4k - 2$, $QR = 4k + 2$, $RP = 4k$

$$\cos P = \frac{1}{3} = \frac{(4k-2)^2 + 16k^2 - (4k+2)^2}{2(4k-2)(4k)} \Rightarrow k = 0, 5$$

For $k = 0$, PQ is negative.

For $k = 5$, sides 18, 20, 22 units.

42. Two lines $L_1 : x = 5$, $\frac{y}{3-\alpha} = \frac{z}{-2}$ and $L_2 : x = \alpha$, $\frac{y}{-1} = \frac{z}{2-\alpha}$ are coplanar. Then α can take value(s)

(A) 1 (B) 2 (C) 3 (D) 4

42. (AD) Point on first line can be considered as $(5, 3-\alpha, -2)$

Point on second line : $(\alpha, -1, 2-\alpha)$

$$\begin{vmatrix} 5-\alpha & 4-\alpha & \alpha-4 \\ 0 & 3-\alpha & -2 \\ 0 & -1 & 2-\alpha \end{vmatrix} = 0 \Rightarrow \begin{vmatrix} 5-\alpha & 0 & \alpha-4 \\ 0 & 1-\alpha & -2 \\ 0 & 1-\alpha & 2-\alpha \end{vmatrix} = 0$$

$$\Rightarrow (1-\alpha) \begin{vmatrix} 5-\alpha & 0 & \alpha-4 \\ 0 & 1 & -2 \\ 0 & 1 & 2-\alpha \end{vmatrix} = 0 \Rightarrow (1-\alpha) [(5-\alpha)(4-\alpha)] = 0$$

$$\Rightarrow \alpha = 1, 4, 5.$$

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Karen Morrison, Nick Hamshaw



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Cambridge IGCSE® Mathematics Core and Extended Coursebook Karen Morrison, Nick Hamshaw, 2018-03-15 This Cambridge IGCSE Mathematics Core and Extended series has been authored to meet the requirements of the Cambridge IGCSE Mathematics syllabus 0580 0980 for first examination from 2020 This second edition of Cambridge IGCSE Mathematics Core and Extended Coursebook offers complete coverage of the Cambridge IGCSE Mathematics 0580 0980 syllabus It contains detailed explanations and clear worked examples followed by practice exercises to allow students to consolidate the required mathematical skills The coursebook offers opportunities for checking prior knowledge before starting a new chapter and testing knowledge with end of chapter and exam practice exercises Core and Extended materials are presented within the same book and are clearly signposted to allow students to see the range of mathematics required for study at this level Answers are at the back of the book *Cambridge IGCSE® and O Level Additional Mathematics Coursebook* Sue Pemberton, 2018-02-22 These resources have been created for the Cambridge IGCSE and O Level Additional Mathematics syllabuses 0606 4037 for first examination from 2020 This coursebook gives clear explanations of new mathematical concepts followed by exercises This allows students to practise the skills required and gain the confidence to apply them Classroom discussion exercises and extra challenge questions have been designed to deepen students understanding and stimulate interest in Mathematics Answers to coursebook questions are in the back of the book

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Karen Morrison,2002-06-27 Written by an experienced mathematics teacher Karen Morrison the text is enquiry based designed for face to face learning and has an interactive approach to the subject Case studies and questions are used to help students understand the implications of the topic CAMBRIDGE IGCSE MATHEMATICS [0580] FULLY SOLVED PAST PAPER 1 and 3 - CORE S. A. I. Gopal

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Hughes,2014-07-18 updated with new questions from top schools colleges from 2003 2013 complete and true encyclopedia of all question types exposes surprise trick questions complete answer keys most efficient method of learning hence saves time arrange from easy to hard by topics and question types to facilitate easy absorption advanced trade book complete and concise eBook editions available also suitable for Cambridge GCE OL Cambridge IGCSE Cambridge IOL Books available for other subjects including Physics Chemistry Biology Mathematics Economics English Primary level Secondary level GCE O level GCE A level iGCSE Cambridge A level Hong Kong DSE visit www.yellowreef.com for sample chapters and more

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