

© International Baccalaureate Organization 2026

All rights reserved. No part of this product may be reproduced in any form or by any electronic or mechanical means, including information storage and retrieval systems, without the prior written permission from the IB. Additionally, the license tied with this product prohibits use of any selected files or extracts from this product. Use by third parties, including but not limited to publishers, private teachers, tutoring or study services, preparatory schools, vendors operating curriculum mapping services or teacher resource digital platforms and app developers, whether fee-covered or not, is prohibited and is a criminal offense.

More information on how to request written permission in the form of a license can be obtained from <https://ibo.org/become-an-ib-school/ib-publishing/licensing/applying-for-a-license/>.

© Organisation du Baccalauréat International 2026

Tous droits réservés. Aucune partie de ce produit ne peut être reproduite sous quelque forme ni par quelque moyen que ce soit, électronique ou mécanique, y compris des systèmes de stockage et de récupération d'informations, sans l'autorisation écrite préalable de l'IB. De plus, la licence associée à ce produit interdit toute utilisation de tout fichier ou extrait sélectionné dans ce produit. L'utilisation par des tiers, y compris, sans toutefois s'y limiter, des éditeurs, des professeurs particuliers, des services de tutorat ou d'aide aux études, des établissements de préparation à l'enseignement supérieur, des fournisseurs de services de planification des programmes d'études, des gestionnaires de plateformes pédagogiques en ligne, et des développeurs d'applications, moyennant paiement ou non, est interdite et constitue une infraction pénale.

Pour plus d'informations sur la procédure à suivre pour obtenir une autorisation écrite sous la forme d'une licence, rendez-vous à l'adresse <https://ibo.org/become-an-ib-school/ib-publishing/licensing/applying-for-a-license/>.

© Organización del Bachillerato Internacional, 2026

Todos los derechos reservados. No se podrá reproducir ninguna parte de este producto de ninguna forma ni por ningún medio electrónico o mecánico, incluidos los sistemas de almacenamiento y recuperación de información, sin la previa autorización por escrito del IB. Además, la licencia vinculada a este producto prohíbe el uso de todo archivo o fragmento seleccionado de este producto. El uso por parte de terceros —lo que incluye, a título enunciativo, editoriales, profesores particulares, servicios de apoyo académico o ayuda para el estudio, colegios preparatorios, desarrolladores de aplicaciones y entidades que presten servicios de planificación curricular u ofrezcan recursos para docentes mediante plataformas digitales—, ya sea incluido en tasas o no, está prohibido y constituye un delito.

En este enlace encontrará más información sobre cómo solicitar una autorización por escrito en forma de licencia: <https://ibo.org/become-an-ib-school/ib-publishing/licensing/applying-for-a-license/>.

Mathematics: analysis and approaches

Standard level

Paper 2

15 May 2026

Zone A morning | Zone B morning | Zone C morning

Session number

1 hour 30 minutes

--	--	--	--	--	--	--	--	--	--

Instructions to students

- Write your session number in the boxes above.
- Do not open this examination paper until instructed to do so.
- A graphic display calculator is required for this paper.
- Section A: answer all questions. Answers must be written within the answer boxes provided.
- Section B: answer all questions in the answer booklet provided. Fill in your session number on the front of the answer booklet, and attach it to this examination paper and your cover sheet using the tag provided.
- Unless otherwise stated in the question, all numerical answers should be given exactly or correct to three significant figures.
- A clean copy of the **mathematics: analysis and approaches SL formula booklet** is required for this paper.
- The maximum mark for this examination paper is **[80 marks]**.



Full marks are not necessarily awarded for a correct answer with no working. Answers must be supported by working and/or explanations. Solutions found from a graphic display calculator should be supported by suitable working. For example, if graphs are used to find a solution, you should sketch these as part of your answer. Where an answer is incorrect, some marks may be given for a correct method, provided this is shown by written working. You are therefore advised to show all working.

Section A

Answer **all** questions. Answers must be written within the answer boxes provided. Working may be continued below the lines, if necessary.

1. [Maximum mark: 6]

The following table shows the number of books read by a group of students at a certain school in a month.

Books read	Frequency
0	3
1	8
2	12
3	15
4	10
5	7
6	4
7	1

(a) Write down the mode.

[1]

(b) Find

(i) the mean;

(ii) the median;

(iii) the standard deviation.

[3]

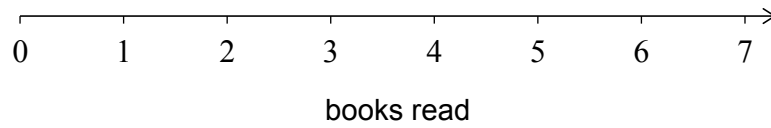
(This question continues on the following page)



(Question 1 continued)

- (c) Draw a box and whisker diagram that represents the number of books read on the scale below.

[2]



.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

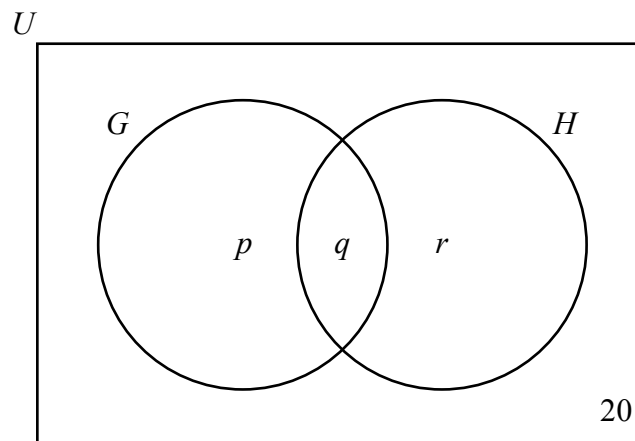


2. [Maximum mark: 6]

A school surveys 150 students about their subject selection.

From the survey, 90 students study geography (G) and 70 students study history (H).

20 students said they do not study either. This is shown in the following Venn diagram, where $p, q, r \in \mathbb{Z}^+$.



- (a) (i) Find the value of q . [3]
- (ii) Find the value of p and the value of r . [3]
- (b) Find the probability that a randomly selected student studies both geography and history. [1]
- (c) Show that the events G and H are not independent. [2]

(This question continues on the following page)



(Question 2 continued)

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

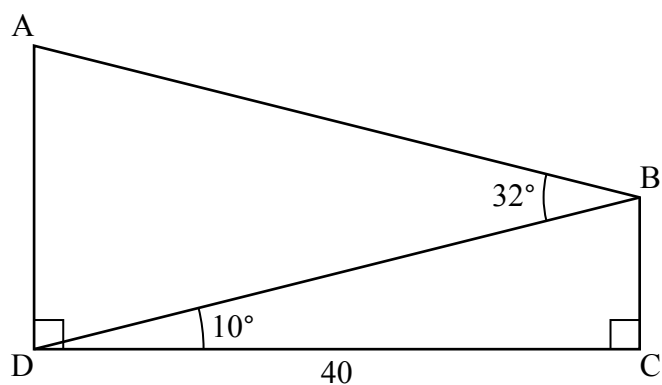


12EP05

Turn over

3. [Maximum mark: 6]

ABCD is a quadrilateral such that AD and BC are both perpendicular to DC. $DC = 40$, $\hat{BDC} = 10^\circ$ and $\hat{ABD} = 32^\circ$. This is shown in the following diagram.



Find AD.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....



4. [Maximum mark: 6]

A closed cylindrical container has base radius r cm and height h cm. The container has a volume of 500 cm^3 .

(a) Show that $h = \frac{500}{\pi r^2}$. [1]

Let the total external surface area of the cylinder be $A\text{ cm}^2$.

(b) Show that $A = 2\pi r^2 + \frac{1000}{r}$. [2]

(c) By using a graph, or otherwise,

(i) find the minimum value of A ;

(ii) write down the corresponding value of r . [3]

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....



5. [Maximum mark: 5]

The velocity, $v \text{ m s}^{-1}$, of a particle at time t seconds, is given by $v = 10 \left(\frac{t^2}{5} - e^{-0.2t} \right)$ for $t \geq 0$.

- (a) Find the initial velocity of the particle. [1]
- (b) Find the distance travelled by the particle in the first five seconds. [2]
- (c) Find the time when the acceleration of the particle is 19.3 m s^{-2} . [2]

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....



6. [Maximum mark: 6]

Consider a binomial random variable, X , such that $X \sim B(15, p)$, where $p \neq 0$.

The mean of the distribution is three times as large as the standard deviation.

(a) Find p . [3]

(b) Find $P(X = 9 | X > 6)$. [3]

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....



Do **not** write solutions on this page.

Section B

Answer **all** questions in the answer booklet provided. Please start each question on a new page.

7. [Maximum mark: 13]

The second term of a geometric sequence is 180 and the third term is 108.

(a) Find

(i) the common ratio;

(ii) the first term.

[4]

Let G_n represent the sum of the first n terms of this geometric sequence.

(b) Find an expression for G_n in terms of n .

[2]

The sum of the first n terms of an arithmetic sequence is given by $A_n = n^2 + 99n$.

(c) For this arithmetic sequence find

(i) the first term;

(ii) the common difference;

(iii) the n th term.

[4]

(d) Find the least value of n such that $A_n > G_n$.

[3]



Do **not** write solutions on this page.

8. [Maximum mark: 15]

The weights of red potatoes are normally distributed with mean 173 grams and standard deviation 21 grams.

(a) Find the probability that a randomly selected red potato weighs

- (i) less than 180 grams;
- (ii) between 180 grams and 200 grams;
- (iii) between 180 grams and 200 grams given it weighs more than 180 grams. [6]

The weights of purple potatoes are normally distributed with mean μ grams and standard deviation σ grams.

The probability that a purple potato weighs less than 170 grams is 0.62102.

The probability that a purple potato weighs between 170 grams and 180 grams is 0.23799.

(b) Find the mean, μ , and standard deviation, σ , of purple potatoes. [6]

Joli has one bag of red potatoes and one bag of purple potatoes.

Joli randomly selects one potato from each bag.

(c) Find the probability that at least one of these potatoes weighs more than 180 grams. [3]



Do **not** write solutions on this page.

9. [Maximum mark: 17]

Consider the function $h(x) = e^x \sin 2x$, where $0 \leq x \leq \frac{\pi}{2}$.

(a) Sketch the graph of $y = h(x)$, labelling the coordinates of the maximum point. [3]

(b) Find an expression for $h'(x)$. [3]

(c) (i) Show that $h''(x) = 4e^x \cos 2x - 3e^x \sin 2x$.

(ii) Find the coordinates of the point of inflexion, P, on the graph of $y = h(x)$. [5]

Let R be the region enclosed by the graph of $y = h(x)$ and a horizontal line that passes through P.

(d) Find the area of R . [4]

The area bounded by the graph of $y = h(x)$, the x -axis and the lines $x = 0$ and $x = k$ is equal to twice the area of R .

(e) Find the value of k . [2]

Disclaimer:

Content used in IB assessments is often taken from authentic, third-party sources. The views expressed within them belong to their individual authors and/or publishers and do not necessarily reflect the views of the IB. Sometimes fictitious companies, products or individuals are included in assessments; any similarities with actual entities are purely coincidental. Any trademarks™ or registered® trademarks included are used for illustrative purposes only, and use does not imply any affiliation with or endorsement by the International Baccalaureate.

