

Markscheme

May 2026

Physics

Standard level

Paper 1b

© 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.

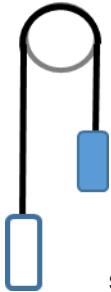
En este enlace encontrará más información sobre cómo solicitar una autorización por escrito en forma de licencia: <https://ibo.org/become-an-ib-school/ib-publishing/licensing/applying-for-a-license/>.

Subject Details: Physics HL/SL Paper 1B Markscheme

Mark Allocation

Candidates are required to answer **ALL** questions. Maximum total = [20 marks].

1. Each row in the “Question” column relates to the smallest subpart of the question.
2. The maximum mark for each question subpart is indicated in the “Total” column.
3. Each marking point in the “Answers” column is shown by means of a tick (✓) at the end of the marking point.
4. A question subpart may have more marking points than the total allows. This will be indicated by “max” written after the mark in the “Total” column. The related rubric, if necessary, will be outlined in the “Notes” column.
5. An alternative wording is indicated in the “Answers” column by a slash (/). Either wording can be accepted.
6. An alternative answer is indicated in the “Answers” column by “**OR**” between the alternatives. Either answer can be accepted.
7. An alternative markscheme is indicated in the “Answers” column under the heading **ALTERNATIVE 1** etc. Any alternative can be accepted.
8. Words in angled brackets « » in the “Answers” column are not necessary to gain the mark.
9. Words that are underlined are essential for the mark.
10. The order of marking points does not have to be as in the “Answers” column, unless stated otherwise in the “Notes” column.
11. If the candidate’s answer has the same “meaning” or can be clearly interpreted as being of equivalent significance, detail and validity as that in the “Answers” column then award the mark. Where this point is considered to be particularly relevant in a question it is emphasized by **OWTTE** (or words to that effect) in the “Notes” column.
12. Remember that many candidates are writing in a second language. Effective communication is more important than grammatical accuracy.
13. Occasionally, a part of a question may require an answer that is required for subsequent marking points. If an error is made in the first marking point then it should be penalized. However, if the incorrect answer is used correctly in subsequent marking points then **follow through** marks should be awarded. When marking, indicate this by adding **ECF** (error carried forward) on the script. “Allow ECF” will be displayed in the “Notes” column.
14. Do **not** penalize candidates for errors in units or significant figures, **unless** it is specifically referred to in the “Notes” column.
15. Allow reasonable substitutions where in common usage, *eg* ° for rad

Question			Answers	Notes	Total
1.	a	i	20.10 N ✓		[1]
1.	a	ii	$\ll \pm \gg 0.12 \text{ N} \quad \checkmark$ $\ll \frac{0.12}{20.10} \times 100 = \gg 0.6\% \quad \checkmark$	Allow $\pm 0.1 \text{ N}$ and 0.5% . Allow use of standard deviation to obtain $\pm 0.09 \text{ N}$ and leading to 0.4% uncertainty.	[2]
1.	b		$\ll \frac{20.10}{9.81} = \gg 2.05 \text{ kg} \quad \checkmark$ relative uncertainties correctly summed $\ll \pm (2.05 \times (0.006 + 0.004)) = \gg \pm 0.02 \quad \checkmark$ $2.05 \pm 0.02 \text{ kg} \quad \checkmark$	Watch for ECF from 1 a(i) and 1 a(ii). MP3 can be awarded if seen in MP1 and MP2 Award MP3 only if absolute uncertainty has 1SF and the mass value matches its precision.	[3]
1.	c		 string drawn vertically down ✓		[1]
1.	d	i	$\ll \theta = 0 \text{ so } \gg \text{ y intercept } \checkmark$	Accept 3.0	[1]

1.	d	ii	ALTERNATIVE 1 indication that k can be determined by the gradient ✓ choice of points and are an appropriate distance apart ($\Delta x \geq 1.5\pi$) ✓ final answer of the gradient ✓ ALTERNATIVE 2 use of y-intercept (0,3) and equation of the line ✓ choice of point that is appropriate distance from y axis ($\Delta x \geq 1.5\pi$) ✓ correct calculation of k ✓	Accept CNA for values from 0.24 to 0.26 with a max [2]. Select responses from one ALT only. Ignore if k value is positive or negative.	[3]
1.	e		same «mass » block ✓ same rod ✓ same string ✓ coefficient of friction is held constant ✓	Accept only references of the material of the string/rod and not dimensions such as length/radius	[2 max]

Question			Answers	Notes	Total
2.	a		ALTERNATIVE 1 equation manipulated to the form $\frac{1}{P} = \frac{m_A}{Mk_B T} \times V$ ✓ each of M, T, m_A, k_B is constant OR direct proportionality as $y = \text{const} \times x$ is identified ✓ ALTERNATIVE 2 $PV = \text{constant}$ ✓ This shows P and V are inversely proportional which is the same as $1/P$ directly proportional to V ✓	Select responses from one ALT only.	[2]
2.	b		« $\text{Pa}^{-1} \times \text{m}^{-3} = \frac{\text{m}^2}{\text{kg} \times \text{m} \times \text{s}^{-2}} \times \text{m}^{-3} = \text{kg}^{-1} \times \text{m}^{-2} \times \text{s}^2$ » OR « $\frac{\text{kg}}{\text{kg}} \times \frac{1}{\text{J} \times \text{K}^{-1}} \times \frac{1}{\text{K}} = \text{kg}^{-1} \times \text{m}^{-2} \times \text{s}^2$ » $X = -1$ ✓ $Y = -2$ ✓	Allow CNA without working. Accept final answer in terms of units i.e. $\text{kg}^{-1} \text{m}^{-2} \text{s}^2$	[2]
2.	c		from graph $\frac{1}{P} = 0.016 \text{ kPa}^{-1}$, so $P = 63 \text{ kPa}$ ✓	Award the mark only for at least 2 significant figures OR working shown. Accept use of $0.0156 \leq y \leq 0.0160$ leading to values $62.5 \leq P \leq 64.1$	[1]

2.	d	i	graph does not go through origin OR graph is shifted to the left ✓		[1]
2.	d	ii	air was also in the tube/sensor OR Total volume includes the volume of the tube/sensor ✓	<i>Explicit reference to the source is needed.</i>	[1]
