Higher

GCSE

Physics B Twenty First Century Science

J259/04: Depth in physics (Higher Tier)

General Certificate of Secondary Education

Mark Scheme for June 2025

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This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by examiners. It does not indicate the details of the discussions which took place at an examiners' meeting before marking commenced.

All examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the report on the examination.

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MARKING INSTRUCTIONS

PREPARATION FOR MARKING
RM ASSESSOR

1. Make sure that you have accessed and completed the relevant training packages for on-screen marking: *RM Assessor Online Training: OCR Essential Guide to Marking*.

2. Make sure that you have read and understood the mark scheme and the question paper for this unit. These are available in RM Assessor

3. Log-in to RM Assessor and mark the **required number** of practice responses (“scripts”) and the **required number** of standardisation responses.

MARKING

1. Mark strictly to the mark scheme.

2. Marks awarded must relate directly to the marking criteria.

3. The schedule of dates is very important. It is essential that you meet the RM Assessor 50% and 100% (traditional 40% Batch 1 and 100% Batch 2) deadlines. If you experience problems, you must contact your Team Leader (Supervisor) without delay.

4. If you are in any doubt about applying the mark scheme, consult your Team Leader by telephone, email or via the RM Assessor messaging system.

5. **Crossed-Out Responses**
Where a candidate has crossed out a response and provided a clear alternative then the crossed-out response is not marked. Where no alternative response has been provided, examiners may give candidates the benefit of the doubt and mark the crossed-out response where legible.

Rubric Error Responses – Optional Questions
Where candidates have a choice of question across a whole paper or a whole section and have provided more answers than required, then all responses are marked and the highest mark allowable within the rubric is given. Enter a mark for each question answered into RM Assessor, which will select the highest mark from those awarded. *(The underlying assumption is that the candidate has penalised themselves by attempting more questions than necessary in the time allowed.)*

Multiple-Choice Question Responses
When a multiple-choice question has only a single, correct response and a candidate provides two responses (even if one of these responses is correct), then no mark should be awarded (as it is not possible to determine which was the first response selected by the candidate).
When a question requires candidates to select more than one option/multiple options, then local marking arrangements need to ensure consistency of approach.

Contradictory Responses
When a candidate provides contradictory responses, then no mark should be awarded, even if one of the answers is correct.

Short Answer Questions (requiring only a list by way of a response, usually worth only one mark per response)
Where candidates are required to provide a set number of short answer responses then only the set number of responses should be marked. The response space should be marked from left to right on each line and then line by line until the required number of responses have been considered. The remaining responses should not then be marked. Examiners will have to apply judgement as to whether a 'second response' on a line is a development of the 'first response', rather than a separate, discrete response. *(The underlying assumption is that the candidate is attempting to hedge their bets and therefore getting undue benefit rather than engaging with the question and giving the most relevant/correct responses.)*

Short Answer Questions (requiring a more developed response, worth two or more marks)
If the candidates are required to provide a description of, say, three items or factors and four items or factors are provided, then mark on a similar basis – that is downwards (as it is unlikely in this situation that a candidate will provide more than one response in each section of the response space).

Longer Answer Questions (requiring a developed response)

Where candidates have provided two (or more) responses to a medium or high tariff question which only required a single (developed) response and not crossed out the first response, then only the first response should be marked. Examiners will need to apply professional judgement as to whether the second (or a subsequent) response is a 'new start' or simply a poorly expressed continuation of the first response.

6. Always check the pages (and additional objects if present) at the end of the response in case any answers have been continued there. If the candidate has continued an answer there, then add the annotation 'SEEN' to confirm that the work has been seen and mark any responses using the annotations in section 11.

7. There is a NR (**No Response**) option. Award NR (No Response):

   - if there is nothing written at all in the answer space
   - OR if there is a comment which does not in any way relate to the question (e.g., 'can't do', 'don't know')
   - OR if there is a mark (e.g., a dash, a question mark) which is not an attempt at the question.

   Note: Award 0 marks – for an attempt that earns no credit (including copying out the question).

8. The RM Assessor **comments box** is used by your Team Leader to explain the marking of the practice responses. Please refer to these comments when checking your practice responses. **Do not use the comments box for any other reason.**

9. Assistant Examiners will send a brief report on the performance of candidates to their Team Leader (Supervisor) via email by the end of the marking period. The report should contain notes on particular strengths displayed as well as common errors or weaknesses. Constructive criticism of the question paper/mark scheme is also appreciated.

10. For answers marked by levels of response:

Read through the whole answer from start to finish, using the Level descriptors to help you decide whether it is a strong or weak answer. The indicative scientific content in the Guidance column indicates the expected parameters for candidates' answers, but be prepared to recognise and credit unexpected approaches where they show relevance. Using a 'best-fit' approach based on the skills and science content evidenced within the answer, first decide which set of level descriptors, Level 1, Level 2 or Level 3, best describes the overall quality of the answer.

Once the level is located, award the higher or lower mark:

The higher mark should be awarded where the level descriptor has been evidenced and all aspects of the communication statement (in italics) have been met.

The lower mark should be awarded where the level descriptor has been evidenced but aspects of the communication statement (in italics) are missing.

In summary:

The skills and science content determines the level.

The communication statement determines the mark within a level.

Level of response questions on this paper are **2(a)** and **7**.

11. Annotations available in RM Assessor

Annotation	Meaning
	Correct response
	Incorrect response
	Omission mark
BOD	Benefit of doubt given
CON	Contradiction
RE	Rounding error
SF	Error in number of significant figures
ECF	Error carried forward
L1	Level 1
L2	Level 2
L3	Level 3
NBOD	Benefit of doubt not given
SEEN	Noted but no credit given
I	Ignore

12. Abbreviations, annotations and conventions used in the detailed Mark Scheme (to include abbreviations and subject-specific conventions).

Annotation	Meaning
/	alternative and acceptable answers for the same marking point
✓	Separates marking points
DO NOT ALLOW	Answers which are not worthy of credit
IGNORE	Statements which are irrelevant
ALLOW	Answers that can be accepted
( )	Words which are not essential to gain credit
__	Underlined words must be present in answer to score a mark
ECF	Error carried forward
AW	Alternative wording
ORA	Or reverse argument

13. **Subject-specific Marking Instructions**

INTRODUCTION

Your first task as an Examiner is to become thoroughly familiar with the material on which the examination depends. This material includes:

- the specification, especially the assessment objectives
- the question paper
- the mark scheme.

You should ensure that you have copies of these materials.

You should ensure also that you are familiar with the administrative procedures related to the marking process. These are set out in the OCR booklet **Instructions for Examiners**. If you are examining for the first time, please read carefully **Appendix 5 Introduction to Script Marking: Notes for New Examiners**.

Please ask for help or guidance whenever you need it. Your first point of contact is your Team Leader.

The breakdown of Assessment Objectives for GCSE (9-1) in Physics B:

	Assessment Objective
AO1	**Demonstrate knowledge and understanding of scientific ideas and scientific techniques and procedures.**
AO1.1	Demonstrate knowledge and understanding of scientific ideas.
AO1.2	Demonstrate knowledge and understanding of scientific techniques and procedures.
AO2	**Apply knowledge and understanding of scientific ideas and scientific enquiry, techniques and procedures.**
AO2.1	Apply knowledge and understanding of scientific ideas.
AO2.2	Apply knowledge and understanding of scientific enquiry, techniques and procedures.
AO3	**Analyse information and ideas to interpret and evaluate, make judgements and draw conclusions and develop and improve experimental procedures.**
AO3.1	Analyse information and ideas to interpret and evaluate.
AO3.1a	Analyse information and ideas to interpret.
AO3.1b	Analyse information and ideas to evaluate.
AO3.2	Analyse information and ideas to make judgements and draw conclusions.
AO3.2a	Analyse information and ideas to make judgements.
AO3.2b	Analyse information and ideas to draw conclusions.
AO3.3	Analyse information and ideas to develop and improve experimental procedures.
AO3.3a	Analyse information and ideas to develop experimental procedures.
AO3.3b	Analyse information and ideas to improve experimental procedures.

<table>
<tr><th colspan="3">Question</th><th>Answer</th><th>Marks</th><th>AO element</th><th>Guidance</th></tr>
<tr><td>1</td><td>(a)</td><td></td><td>
<table>
<tr><th></th><th>True</th><th>False</th></tr>
<tr><td>Both the forces are acting on the person</td><td></td><td>✓</td></tr>
<tr><td>They are the same kind of force</td><td>✓</td><td></td></tr>
<tr><td>The forces are opposite in direction</td><td>✓</td><td></td></tr>
<tr><td>The normal reaction force equals 700 N</td><td>✓</td><td></td></tr>
</table>
✓✓✓</td><td>3</td><td>2.1</td><td>All Four ticks correct = 3 marks
Two or three correct = 2 marks
One correct = 1 mark</td></tr>
<tr><td></td><td>(b)</td><td></td><td>Friction ✓</td><td>1</td><td>1.1</td><td></td></tr>
<tr><td></td><td>(c)</td><td></td><td>The iron bar <u>attracting</u> a magnet. ✓

The piece of paper attracting the <u>positively</u> charged rod. ✓

The gravitational force of the <u>Moon</u> on the <u>Earth.</u> ✓✓</td><td>4</td><td>2.1</td><td></td></tr>
</table>

Question			Answer	Marks	AO element	Guidance
2	(a)*		Please refer to the marking instructions on page 4 of this mark scheme for guidance on how to mark this question. **Level 3 (5–6 marks)** Explanation of the process in which atoms change due to exposure to UV radiation and connects this to damage to human tissue **AND** Links to why sunscreen is used to protect the skin *There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated.* **Level 2 (3–4 marks)** Explanation of the process in which atoms change due to exposure to UV radiation and connects this to damage to human tissue **OR** Explanation of why using sunscreen is used to protect the skin *There is a line of reasoning presented with some structure. The information presented is relevant and supported by some evidence.* **Level 1 (1–2 marks)** Statement of the process in which atoms change due to exposure to UV radiation **OR** Statement of how/why using sunscreen is important *There is an attempt at a logical structure with a line of reasoning. The information is in the most part relevant.* **0 marks** No response or no response worthy of credit.	**6**	**4 x 1.1** **2 x 2.1**	**AO1.1** Knowledge of changes in atoms from exposure to EM radiation • Negative electrons orbit the nucleus of atoms • Ionisation is the removal of an electron from an atom • UV is absorbed by atoms/electrons/cells • UV has enough energy to cause an electron to be emitted • UV can be absorbed by atoms in cells causing the atom to increase in energy and changing the arrangement of the electrons around the nucleus • Atom is ionised and becomes an ion • UV has enough energy to cause an electron to be emitted / ionisation. • UV is absorbed by human cells causing mutations (DNA) / changes / damage to the cell **AO2.1** Explain why sunscreen is important • Exposure to UV radiation causes sunburnt skin • Damaged cells may grow in an uncontrolled way • Which leads to cancer • Sunscreen reduces the intensity of radiation reaching the skin, reducing the chance of damage to cells • Prevents skin from absorbing UV radiation

Question			Answer	Marks	AO element	Guidance
	(b)	(i)	Any **two** from: Use a measured amount/volume/mass of sunscreen ✓ Use more SPF's✓ Use same brand of sunscreen ✓ Place in the same place (outside)/carry out at the same time✓ Use UV lamp (in the lab) ✓ Repeat reading for each SPF **and** calculate the mean✓ Record the time for each bead to change **and** calculate the mean (for the same SPF) ✓ Add a control with no suncream✓	**2**	**3.3a**	 **ALLOW** same thickness of layer of sunscreen **ALLOW** same size of bead **ALLOW** use higher SPF's **IGNORE** multiple brands of sunscreen **IGNORE** put all the beads in the same petri dish **IGNORE** use more beads **IGNORE** experiments investigating another factor (e.g. test all SPFs at different times of day)
		(ii)	No units (for time) ✓ Inconsistent number of decimal places / significant figures ✓	**2**	**3.3b**	**IGNORE** ref to repeat values and mean **ALLOW** values are not to the same rounding or precision/resolution **IGNORE** 3.25 unqualified

Question			Answer	Marks	AO element	Guidance
3	(a)		92 protons 143 neutrons	2	2.1	
	(b)		$^{235}_{92}U \rightarrow {}^{231}_{90}Th + {}^{4}_{2}He$ ✓	1	2.1	
	(c)	(i)	The time taken for the activity to fall by half ✓	1	1.1	
	(c)	(ii)	17.5 (cpm) ✓	1	2.2	**ALLOW** 17.0 to 18.0 (cpm)
	(c)	(iii)	**First check the answer on the answer line.** **If answer = 8.75 (cpm) award 2 marks** 21 = 3 half-lifes **OR** 3 x 7 (x 10^8) **OR** c(ii) ÷ 2 ✓ 8.75 (cpm) ✓	2	3.2a	**ALLOW** 17.0 to 18.0 divided by 2 e.g. 8.5 – 9.0 (cpm) 2 marks **ECF** c(ii) if working shown 2 marks
	(d)		neutrons✓ chain ✓ kinetic✓ gamma✓	4	1.1	

Question			Answer	Marks	AO element	Guidance
4	(a)	(i)	Any **two** from: Thickness (of each layer) of insulation/bubble wrap ✓ Volume/size/shape/material of beaker✓ Volume/mass of water ✓ Starting temperature of water ✓	2	3.3a	 **ALLOW** same type of bubble wrap **IGNORE** amount of water **IGNORE** ref to external temperature/surroundings
		(ii)	Reduces the transfer of heat energy (to the surroundings) ✓	1	2.2	**ALLOW** reduces convection (currents)/prevents warm air rising **ALLOW** reduces evaporation
	(b)	(i)	As the number of layers increases the change in temperature is smaller/decreases **ORA**✓	1	3.2b	**ALLOW** stays hotter/higher temperature with more layers **ORA** **ALLOW** more layers reduces the **rate** of temperature decrease
		(ii)	Decreases✓	1	3.2b	
		(iii)	The gradient decreases (over 25 minutes)✓	1	3.2b	**ALLOW** the line/graph is steeper (at the beginning) and becomes shallower/flatter (at the end)
		(iv)	Any value from 40 < 47 (^{0}C)	1	3.2a	

Question			Answer	Marks	AO element	Guidance
5	(a)	(i)	**First check the answer on the answer line. If answer = 1.2 (N m) award 3 marks** Convert cm to m distance = 0.15 ✓ Select and apply: moment = force x (perpendicular) distance of force to pivot = 8 x 0.15 ✓ = 1.2 (N m) (clockwise) ✓	3	**1 x 1.2** **1 x 1.1** **1 x 2.2**	**ALLOW** 2 marks for 1.2 x 10^n incorrect conversion of distance
		(ii)	**EITHER Description or correctly labelled diagram** Left hand side 30cm/0.3m from pivot ✓ (4N force) Clockwise / upwards (LHS) ✓ **Or** Right hand side 30cm/0.3m from pivot ✓ (4N force) Clockwise / downwards (RHS) ✓	2	2.1	**IGNORE** length of distance arrow if 30cm/0.3m correctly labelled
	(b)	(i)	Arrow in anti-clockwise direction ✓	1	3.2a	
		(ii)	**First check the answer on the answer line. If answer = 1 award 2 marks** 7: 21 Ratio = 1/3 or 7/21 ✓ 1 ✓	2	3.2b	

Question			Answer	Marks	AO element	Guidance
6	(a)	(i)	Any **two** from: Chemical store (in battery) ✓ (transferred to) electrostatic store (charges) ✓ (to) thermal/internal energy store (in the resistors/wires) ✓	**2**	**2.1**	**IGNORE** electrical energy/kinetic energy (charges) **ALLOW** energy transferred by electrical work
		(ii)	**First check the answer on the answer line. If answer = 0.2(A) award 4 marks** Equivalent resistance = 30 + 30 (Ω) ✓ (= 60 (Ω)) Select and rearrange: Current = pd / resistance ✓ Current = 12 / 60 ✓ = 0.2 (A) ✓ **OR** Pd across one resistor = 12/2 = 6V ✓ Select and rearrange: Current = pd / resistance ✓ Current = 6 / 30 ✓ = 0.2 (A) ✓	**4**	**1 x 3.2a** **3 x 2.2**	**ALLOW** 3 marks for answer = 0.4 (A) for both methods (30 Ω or 12V)

Question			Answer	Marks	AO element	Guidance
		(iii)	**First check the answer on the answer line. If answer = 48 (J) award 4 marks** Select and apply charge = current x time Q = 0.2 x 20 (= 4 (C)) ✓ Select and rearrange work done = pd x charge ✓ work done = 12 x 4 ✓ = 48 (J) ✓ **Alternative method** Select and apply Power = pd x current ✓ P = 12 x 0.2 = 2.4 (W) Select Energy = Power x time ✓ Energy = 2.4 x 20 ✓ = 48 (J) ✓	**4**	**1 x 1.1** **3 x 2.1**	**ECF** from (ii) for current

		(iv)	**First check the answer on the answer line.** **If answer = 2.4 W award 3 marks** Select and apply power = potential difference x current = 12 x 0.2✓ = 2.4 ✓ watt or W ✓ **OR** Select and apply power = $\frac{\text{energy transferred}}{\text{time}}$ = 48/20 ✓ = 2.4 ✓ watt or W ✓ **OR** Select and apply power = current^2 x resistance = 0.2^2 x (30+30) ✓ = 2.4 ✓ watt or W ✓	**3**	**1 x 1.1** **1 x 2.1** **1 x 1.2**	**ALLOW** **ECF** a(ii) **ALLOW** **ECF** a(iii) **ALLOW** **ECF** a(ii)
	(b)	**(i)**	**First check the answer on the answer line.** **If answer = 0.4 (A) award 2 marks** PD across R1 = 12V ✓ Current in R1 = 12 / 30 = 0.4 (A) ✓	**2**	**1 x 3.2b** **1 x 2.2**	
		(ii)	In the parallel circuit there are more paths for the current/charge ✓ (net) resistance in series > (net) resistance in parallel ✓	**2**	**2.1**	**ALLOW ORA**

Question			Answer	Marks	AO element	Guidance
7*			Please refer to the marking instructions on page 4 of this mark scheme for guidance on how to mark this question. **Level 3 (5–6 marks)** Uses the particle model of matter to explain how the work done by the force of gravity causes the temperature to increase **AND** describes how fusion reactions start **AND** describes how balanced forces keeps the Star stable. *There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated.* **Level 2 (3–4 marks)** Uses the particle model of matter to explain how the work done by the force of gravity causes the temperature to increase **AND** describes how fusion reactions start. **OR** Describes how fusion reactions start **AND** describes how balanced forces keeps the Star stable. **OR** Uses the particle model of matter to explain how the work done by the force of gravity causes the temperature to increase **AND** describes how balanced forces keeps the Star stable	**6**	**2 x 1.1** **2 x 2.1** **2 x 3.1a**	**AO 1.1** • When a force is used to compress a gas, work is done on the gas, leading to an increase in temperature. **AO 2.1** • Gravitational forces between gas/dust particles causes volume to decrease • Work done by the force of gravity in bringing the particles closer together increases the temperature. • Particles are closer together and move faster • Distance between particles decreases/greater pressure - more collisions between particles • Fusion starts when particles are close together and the temperature is v.high causing a high pressure **AO 3.1a** • (Temperature and) pressure increase as distance between particles decreases as work is done on particles by the force of gravity • Particles need sufficient speed (high temperature) AND be close together (high pressure) in order to start fusion.

Question			Answer	Marks	AO element	Guidance
			There is a line of reasoning presented with some structure. The information presented is relevant and supported by some evidence. **Level 1 (1–2 marks)** The idea that the temperature of the stable star is much greater than that of the cloud of dust and gas particles **OR** Description on how fusion reactions start. **OR** The idea that forces are balanced in a stable star *There is an attempt at a logical structure with a line of reasoning. The information is in the most part relevant.* **0 marks** No response or no response worthy of credit.			• The equilibrium between gravitational forces and outwards radiation pressure from fusion energy keeps star stable .

Question			Answer	Marks	AO element	Guidance
8	(a)	(i)	**First check the answer on the answer line.** **If answer = 0.15 (J) award 3 marks** Select: Kinetic energy = 0.5 x mass x (speed)^2 ✓ KE = 0.5 x 1.2 x 0.5^2 ✓ = 0.15 (J) ✓	3	 **1 x 1.2** **2 x 2.2**	
		(ii)	**First check the answer on the answer line.** **If answer = 0.84 (kg m/s) award 3 marks** Select and apply: Momentum = mass x velocity Initial momentum = 1.2 (kg) x 0.5 (m/s) = 0.6 (kg m/s) **OR** Final momentum = 1.2 (kg) x 1.2 (m/s) = 1.44 (kg m/s) ✓ Change in momentum = 1.44 – 0.6 (kg m/s) ✓ = 0.84 (kg m/s) ✓	3	 **1 x 1.2** **2 x 2.2**	**ALLOW** 1 mark for change in momentum = mΔv **ALLOW** 2 marks for change in momentum = 1.2 x 0.7
		(iii)	**First check the answer on the answer line.** **If answer = 0.17 award 4 marks** Select and apply: $change\ in\ momentum = Force \times time$ 0.84 = 5 x time ✓ Rearrange: $Time = \frac{\text{change in momentum}}{\text{Force}} = \frac{0.84}{5}$ ✓ = 0.168 (s) ✓ = 0.17 (s) ✓	4	 **1 x 1.2** **2 x 2.2** **1 x 1.2**	**ECF** (a)(ii) **ALLOW** 1 mark for clear evidence of an incorrect answer correctly rounded to 2 decimal places.

Question			Answer	Marks	AO element	Guidance
			Alternative method Select and apply: F=ma **and** a=Δv÷t ✓ Acceleration = 5 ÷ 1.2 = 4.17(m/s^2) ✓ Time = 0.7 ÷ 4.17 = 0.168(s) ✓ = 0.17 (s) ✓			

Question			Answer	Marks	AO element	Guidance
	(b)		**EITHER** The resultant/net forward force is reduced✓ (Since mass is constant the resultant) force is proportional to acceleration / acceleration is lower ✓ (so) increasing the time taken ✓ **OR** Work is done against the force of friction ✓ (Some) energy is transferred to the surroundings/as thermal energy ✓ (so) increasing the time taken ✓	**3**	**2.1**	**ALLOW** F ∝ a **ALLOW** F = ma with m constant
	(c)		The (inertial) mass is a measure of the trolley's resistance to a change in its motion/velocity OWWTE ✓ With any **one** from: (inertial) mass is the ratio of the force over acceleration / $m \propto \frac{1}{a}$ ✓ (smaller acceleration) if same force is applied to a greater (inertial) mass ✓ (smaller) acceleration = same force / greater (inertial) mass ✓	**2**	**3.2b**	**IGNORE** more force is needed to move a greater (inertial) mass **ALLOW** mass is a measure of inertia **ALLOW** (inertial mass) m = F ÷ a

Question			Answer	Marks	AO element	Guidance
9	(a)	(i)	Any **two** from: energy ✓ wavelength/frequency ✓ microwaves pass through the ionosphere ✓ radio waves are retransmitted/reflected (in the ionosphere) ✓	**2**	**1.1**	**CON** different speeds
		(ii)	Any **two** from: Same speed/travel at the speed of light/$3x10^8$ ms^{-1}✓ Transverse waves/oscillation is at right angles to the direction of motion ✓ Transfer energy ✓ Can travel through a vacuum ✓	**2**	**1.1**	**IGNORE** ref to uses of radio waves and microwaves **ALLOW** Do not require a medium to travel **ALLOW** (Radio waves and microwaves) are not ionising **ALLOW** Consist of photons
	(b)		(Varying Potential Difference causes) oscillation of current/electrons/charge ✓ **OR** (Moving charge/current) generates changing EM fields/waves. ✓	**1**	**1.1**	**ALLOW** alternating current
	(c)		**First check the answer on the answer line.** **If answer = 4.0 x 10^{-4} (s) award 3 marks** Select and apply: distance = speed x time 2 x 6 x 10^4 = 3 x 10^8 x time ✓ (Time) = 2 x 6 x 10^4 / 3 x 10^8 = 0.0004 (s) ✓ = 4 x 10^{-4} (s) ✓	**3** **1 x 1.1** **2 x 2.2**		Give full credit to a candidate who makes an estimate of either, the horizontal distance between Rx and Tx, or, the angle, and uses trigonometry to estimate the distance. **ALLOW** No factor of 2 6 x 10^4 / 3 x 10^8 = 2 x 10^{-4} (s) ✓✓ **ALLOW** 1 mark for clear evidence of an incorrect answer correctly written in standard form.