

**MARK SCHEME**

Subject Code: 10

MATHEMATICS SPECIMEN PAPER

Paper Code: 02

Paper 2 Mathematics 2

2026

Maximum Mark: 60

ANNOTATIONS

The following annotations are used in marking this paper and should be used by markers.

Annotation	Use or meaning
√	Correct and relevant point made in answering the question.
X	Incorrect point or error made.
M	Method marks – for a correct method applied to appropriate numbers
A	Accuracy marks – depend on M marks, hence M0 A1 is not possible
B	Independent of method marks – for a correct answer, a partially correct answer or intermediate stage
FT	Work can be followed through after an error
AG	Answer given
ISW	Ignore subsequent working (after correct answer obtained)
CAO	Correct answer only
OE	Or equivalent
SOI	Seen or implied
DEP	Dependent on the previous mark(s)
OF	Own figure

Generic Marking Principles

These generic marking principles must be followed by all markers when assessing candidates' responses. They should be used together with the specific details provided in the mark scheme or the generic level descriptors for each question. Every question paper and its corresponding mark scheme will also adhere to these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in accordance with:

- the specific content of the mark scheme or the generic level descriptions provided for the question,
- the specific skills identified in the mark scheme or descriptors, and
- the standard of performance expected from candidates, as exemplified through standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Only whole marks are to be awarded. No half marks or fractional marks should be given under any circumstances.

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded positively:

- Credit must be given for correct and valid responses, as outlined in the mark scheme.
- Where a candidate's response exceeds the expected content or extends beyond the syllabus in a relevant way, appropriate credit may be awarded, in consultation with the Chief Marker.
- Marks are awarded when the candidate demonstrates clear evidence of knowledge, understanding, or skill.
- Marks must not be deducted for incorrect answers, omissions, or irrelevant material.
- Spelling, punctuation, and grammar should only be considered if explicitly stated in the question's assessment criteria. However, responses must be sufficiently clear in meaning.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently across all scripts, including cases where candidates do not follow specific instructions or where generic level descriptions are applied. For example, if a candidate writes more answers than required or responds in the wrong format, the marker should still assess the response based on the marking scheme. If the marking scheme includes a penalty for not following instructions, it should be applied. If no penalty is mentioned, valid responses should still be credited.

In the case of generic level descriptions such as "basic understanding" or "detailed explanation", all markers must interpret and apply these levels in the same way across all scripts. This helps ensure that every candidate is marked fairly and consistently.

GENERIC MARKING PRINCIPLE 5:

The full range of marks available in the mark scheme must be used where appropriate. However, the actual distribution of marks may depend on the quality of responses observed.

GENERIC MARKING PRINCIPLE 6:

Marks must be awarded strictly based on the criteria and expectations defined in the mark scheme. Judgments should not be influenced by grade thresholds, grade descriptions, or assumptions about overall candidate performance.

Point-Based Marking

Guidance:

- DO credit answers which are worded differently from the mark scheme if they clearly convey the same meaning (unless the mark scheme requires a specific term).
- DO credit alternative answers/examples which are not written in the mark scheme if they are correct.
- DO NOT credit answers simply for using a 'key term' unless that is all that is required. (Check for evidence it is understood and not used wrongly.)
- DO NOT credit answers which are obviously self-contradicting or trying to cover all possibilities.
- DO NOT give further credit for what is effectively repetition of a correct point already credited unless the language itself is being tested. This applies equally to 'mirror statements' (i.e. polluted/not polluted).
- DO NOT require spellings to be correct, unless this is part of the test. However, spellings of syllabus terms must allow for clear and unambiguous separation from other syllabus terms with which they may be confused (e.g. Corrasion/Corrosion).

Calculation

- The mark scheme will outline the steps for the most likely correct method(s), including the marks allocated for each step, the correct answer(s), and the marks awarded for the final answer.
- If working or explanation is required to obtain full credit, this will be clearly stated in both the question paper and the mark scheme. In all other cases, a correct final answer should receive full marks even if no supporting working is provided.
- If a candidate applies a valid method that is not specifically included in the mark scheme, equivalent marks should be awarded for achieving equivalent stages of the solution.
- Where a candidate uses an incorrect figure obtained from earlier working, the 'own figure rule' applies. Full marks may still be awarded provided the method used is correct and complete. Additional guidance or exceptions to this principle will be specified in the mark scheme where necessary.

Assessment Objectives

AO1: Knowledge and understanding of mathematical techniques

- Recall and apply mathematical knowledge and techniques
- Carry out routine procedures in mathematical and everyday situations
- Understand and use mathematical notation and terminology
- Perform calculations with a calculator
- Organise, process, present and understand information in written form, tables, graphs and diagrams
- Estimate, approximate and work to degrees of accuracy appropriate to the context and convert between equivalent numerical forms
- Understand and use measurement systems in everyday use
- Measure and draw using geometrical instruments to an appropriate degree of accuracy
- Recognise and use spatial relationships in two and three dimensions.

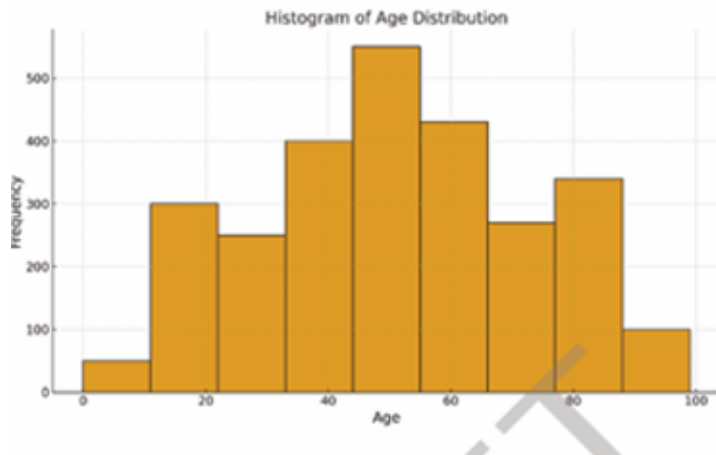
AO2: Analyse, interpret and communicate mathematically

- Analyse a problem and identify a suitable strategy to solve it, including using a combination of processes where appropriate
- Make connections between different areas of mathematics
- Recognise patterns in a variety of situations and make and justify generalisations
- Make logical inferences and draw conclusions from mathematical data or results
- Communicate methods and results in a clear and logical form
- Interpret information in different forms and change from one form of representation to another.

SECTION A (10 Marks)

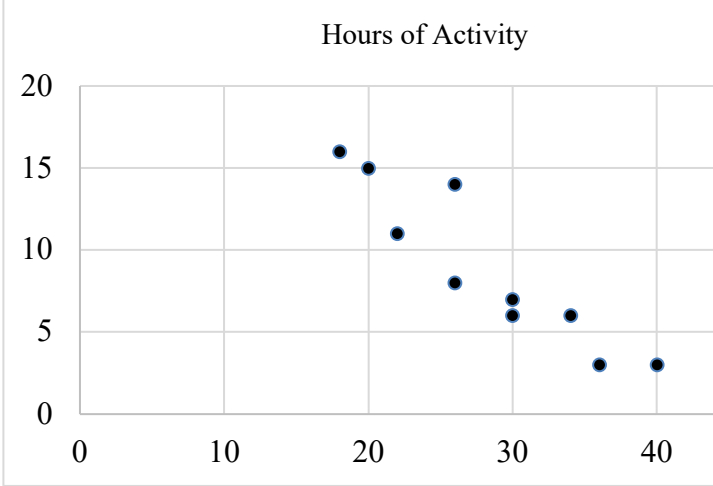
Question I	Answer	Marks
1	D	1
2	D	1
3	C	1
4	D	1
5	A	1
6	D	1
7	A	1
8	B	1
9	D	1
10	C	1

SECTION B (60 Marks)

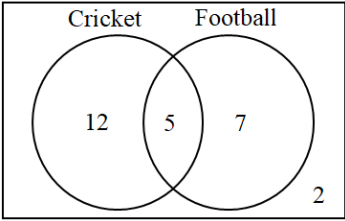
Question	Answer	Marks	Additional Guidance
II(1)	Correct axes with appropriate scale; label age (x-axis) and frequency (y-axis)	M1	Distribution type: Bimodal (peaks at 33-44 and 44-55). Accept: roughly normal, slightly skewed.
	Histogram drawn accurately with correct bar heights (class width consistent). 	A1	Award marks for clear histogram even if description varies.
		2	

II(2)	Identify median position = 15th & 16th values; use cumulative frequency.	M1	Cumulative freq: 2, 7, 17, 26, 30. Median class: 140-150.
	Correct median = 147 cm (or 146-148 range accepted).	A1	<i>Median(Q_2):</i> $30 \times 0.5 = 15$ $\therefore Q_2 \text{ falls between } 15^{\text{th}} \text{ and } 16^{\text{th}} \text{ data value.}$ $Q_2 = 140 + \frac{8.5}{10} \times 10$ $= 148.5 \text{ cm}$
		2	
II(3)	Arrange in order: 9, 11, 11, 14, 17, 18, 19, 20, 20, 22.	M1	Clearly label all five values. Show ordering process.

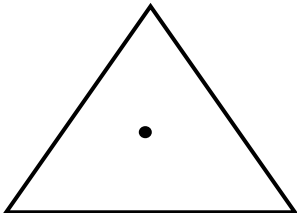
	Min=9, Q1=11, Median=17.5, Q3=20, Max=22.	A1	for correct median even if quartiles differ. <i>Arrange data in ascending order</i> 9, 11, 11, 14, 17, 18, 19, 20, 20, 22 <i>minimum value = 9</i> <i>maximum value = 22</i> $Q_1 = 11$ $Q_2 = \frac{17+18}{2} = 17.5$ $Q_3 = 20$
		2	

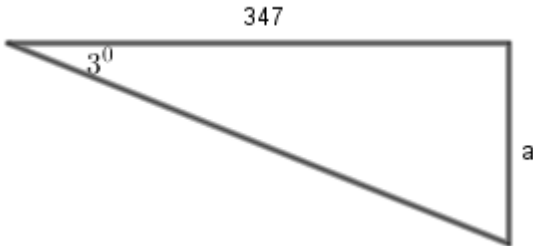
II(4)(a)	Plot all 10 points accurately; scale axes appropriately (Age: 15-45, Hours: 0-18).	M2	Points should show clear pattern. Axes labeled with units.
		2	
II(4)(b)	Negative correlation (strong). As age increases, physical activity decreases.	A1	Accept: "strong negative" or "inverse". Do NOT accept positive.
		1	
II(5)	Plot all 10 points with correct scale (Year: 2010-2019, Goals: 40-75).	M1	No correlation analysis required here—just accurate plotting.
	Title, labeled axes, readable points.	A1	
		2	
III(1)	Set up probability correctly; recognize replacement makes events independent. Favorable outcomes when 2nd > 1st.	M1	Count pairs: If 1st = 1, then 2nd ∈ {2,3,...,10} = 9 ways. Total pairs = 10×10 = 100. Favorable = 9+8+7+...+1 = 45.

	i. Value of second card compared to first card. Value of first card drawn <table><tr><td></td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr><tr><td>1</td><td>=</td><td>></td><td>></td><td>></td><td>></td><td>></td><td>></td><td>></td><td>></td><td>></td></tr><tr><td>2</td><td><</td><td>=</td><td>></td><td>></td><td>></td><td>></td><td>></td><td>></td><td>></td><td>></td></tr><tr><td>3</td><td><</td><td><</td><td>=</td><td>></td><td>></td><td>></td><td>></td><td>></td><td>></td><td>></td></tr><tr><td>4</td><td><</td><td><</td><td><</td><td>=</td><td>></td><td>></td><td>></td><td>></td><td>></td><td>></td></tr><tr><td>5</td><td><</td><td><</td><td><</td><td><</td><td>=</td><td>></td><td>></td><td>></td><td>></td><td>></td></tr><tr><td>6</td><td><</td><td><</td><td><</td><td><</td><td><</td><td>=</td><td>></td><td>></td><td>></td><td>></td></tr><tr><td>7</td><td><</td><td><</td><td><</td><td><</td><td><</td><td><</td><td>=</td><td>></td><td>></td><td>></td></tr><tr><td>8</td><td><</td><td><</td><td><</td><td><</td><td><</td><td><</td><td><</td><td>=</td><td>></td><td>></td></tr><tr><td>9</td><td><</td><td><</td><td><</td><td><</td><td><</td><td><</td><td><</td><td><</td><td>=</td><td>></td></tr><tr><td>10</td><td><</td><td><</td><td><</td><td><</td><td><</td><td><</td><td><</td><td><</td><td><</td><td>=</td></tr></table> Value of second card drawn		1	2	3	4	5	6	7	8	9	10	1	=	>	>	>	>	>	>	>	>	>	2	<	=	>	>	>	>	>	>	>	>	3	<	<	=	>	>	>	>	>	>	>	4	<	<	<	=	>	>	>	>	>	>	5	<	<	<	<	=	>	>	>	>	>	6	<	<	<	<	<	=	>	>	>	>	7	<	<	<	<	<	<	=	>	>	>	8	<	<	<	<	<	<	<	=	>	>	9	<	<	<	<	<	<	<	<	=	>	10	<	<	<	<	<	<	<	<	<	=		
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	$P(2nd\ card > 1st\ card) = \frac{45}{100} = \frac{9}{20} \dots\dots\dots(1)$	A1																																																																																																																										
		2																																																																																																																										
III(2)	Identify that both events must occur; determine probabilities from spinner. <table><tr><td></td><td>1</td><td>2</td><td>3</td></tr><tr><td>1</td><td>(1,1)</td><td>(1,2)</td><td>(1,3)</td></tr><tr><td>2</td><td>(2,1)</td><td>(2,2)</td><td>(2,3)</td></tr><tr><td>3</td><td>(3,1)</td><td>(3,2)</td><td>(3,3)</td></tr></table>		1	2	3	1	(1,1)	(1,2)	(1,3)	2	(2,1)	(2,2)	(2,3)	3	(3,1)	(3,2)	(3,3)	M1	Show: $P(1st\ spin = 1) \times P(2nd\ spin = 3)$ using multiplication rule.																																																																																																									
	1	2	3																																																																																																																									
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3	(3,1)	(3,2)	(3,3)																																																																																																																									
	Multiply probabilities correctly. There are 9 outcomes altogether and 1 of them is a 1 and then a 3 so $P(1, then\ 3) = \frac{1}{9} \dots\dots\dots(1)$	A1	$P(1, then\ 3) = P(1) \times P(3)$ $= \frac{1}{3} \times \frac{1}{3} = \frac{1}{9}$																																																																																																																									

		2	
III(3) (a)	Use Venn diagram approach <i>i. $P(\text{only cricket}) = \frac{12}{26}$ OR $\frac{6}{13}$</i>	A1	
		1	
III(3) (b)	<i>ii. $P(\text{only football}) = \frac{7}{26}$</i>	A1	Similar to (i). Subtract overlap.
		1	
III(3) (c)	<i>iii. $P(\text{cricket and football}) = \frac{24}{26}$ OR $\frac{12}{13}$</i>	A1	Direct from problem.
		1	
III(4)	Set up conditional probability formula: <i>Solution :</i> <i>$P(\text{yellow and green}) = P(\text{green} / \text{yellow}) \times P(\text{yellow})$</i>	M1	Without replacement. Show clear formula & substitution.
	40% = 0.4 $0.4 = P(\text{green} / \text{yellow}) \times 0.8$ --- [1] $\frac{0.4}{0.8} = P(\text{green} / \text{yellow})$	M1	
	$\therefore P(\text{green} / \text{yellow}) = 0.5$ --- [1]	A1	
		3	

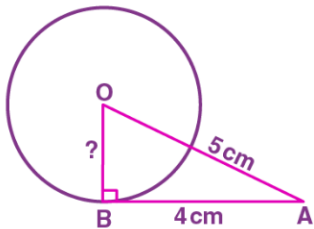
IV(1)	Identify required 2nd spin value (must be 4 to sum to 6). Determine probability from spinner.	<table><tr><td colspan="2" rowspan="2">Sum</td><td colspan="5">First Spin</td></tr><tr><td>1</td><td>2</td><td>2</td><td>4</td><td>4</td></tr><tr><td rowspan="5">Second Spin</td><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>2</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>2</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>4</td><td></td><td>6</td><td>6</td><td></td><td></td><td></td></tr><tr><td>4</td><td></td><td>6</td><td>6</td><td></td><td></td><td></td></tr></table>	Sum		First Spin					1	2	2	4	4	Second Spin	1							2							2							4		6	6				4		6	6				M1	If spinner has 8 equal sections: P = 1/8 (if one "4"). Adjust based on spinner image
	Sum				First Spin																																															
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Calculate final probability. $P(2, sum\ 6) = \frac{4}{25}$	A1																																																			
	2																																																			
IV(2) (a)	i. Close to Normal distribution	A1																																																		
		1																																																		
IV(2) (b)	ii. 65	A1																																																		
		1																																																		
	iii. Write down any TWO observations	M1	The highest math marks was about 90.																																																	

IV (2)			• The lowest math mark was about 30. • 50% of the students scored between 57 and 74. • 75% of the students scored above 57. • 25% of the students scored below 56.
		1	
IV(3)	Correct shape with 3 order of turn symmetry	M1	Accept any shape with 3-fold rotational symmetry. 
	Mark center of rotation clearly;	A1	Must show center point
		2	
IV(4)	Identify order of rotational symmetry from image	M1	One axis of rotation from centre of one base to the centre of the opposite base with a turn order of 4.
	Describe axis & degree of rotation	A1	Four axes of rotation from the midpoint of one edge to the midpoint of the opposite edge in the lateral faces with a turn order of 2.
	.	2	

IV(5)	Drawing of right angle triangle  $\tan 3^\circ = \frac{a}{347}$ $0.052 = \frac{a}{347}$	M1	
	$a \approx 18.0 \text{ m}$ The plane is flying at a altitude of 18 m.	A1	
		2	
V(1)(a)	Explain that 35.8 s, 36.5 s, 37.0 s overlap within uncertainty; cannot be certain.	M2	Accept: "Rounding error", "Similar times within margin of error." Award for acknowledging uncertainty. we cannot be certain that Tashi was fastest because it is possible that Penjor was faster, since his time of 36s might have rounded up from 35.5s, 35.6 s, or 35.7 s, which is faster than Tashi at 35.8s. we cannot be certain that Devi and Dorji were equally slow since 41s could be anywhere from 40.5s to 41.4s.

		2	
V(1)(b)	One thing would cause inaccuracy is if the stop watch was not started and stopped correctly	M1	Possible answers: human reaction lag, measurement device limits, environmental variation.
		1	
V(2)	Start with identity $\sec^2 \theta = 1 + \tan^2 \theta$.	M1	Use fundamental trig identity. Clear algebraic steps required. $ii. \frac{\sec^2 \theta - 1}{\tan^2 \theta} = 1$ $\therefore \sec^2 \theta = 1 + \tan^2 \theta$ $\sec^2 \theta - 1 = \tan^2 \theta$
	Prove RHS=LHS	M2	$\therefore \frac{\tan^2 \theta}{\tan^2 \theta} = 1$
		2	
V(3)	From cot, deduce adjacent=5, opposite=13. Use Pythagorean theorem: $Adj = 12$	M1	$\cot A = \frac{13}{5}$ $Adj = \sqrt{13^2 - 5^2}$ $= \sqrt{169 - 25}$ $= \sqrt{144}$ $= 12$
	Value of $\sin A$ $\sin A = \frac{5}{13}$ or 0.38	M1	Show clear triangle diagram. Rationalize denominators if required. Award partial credit for correct method
	Value of $\cos A$	B1	

	$\cos A = \frac{12}{13} \text{ or } 0.92$		
	Value of $\tan A$ $\tan A = \frac{5}{12} \text{ or } 0.42$	A1	
		4	
VI(1)	Identify shape for the value of radius $r = 15 \text{ cm}$	M1	$r = d \div 2 = 30 \div 2 = 15$
	Calculate surface area correctly. $SA_{\text{cylinder}} = 4712.39 \text{ cm}^2$	A1	$h = 35 \text{ cm}$ $SA = 2\pi r^2 + 2\pi rh$ $= 2 \times \pi \times 15^2 + 2 \times \pi \times 15 \times 35$ $\approx 4712.39 \text{ cm}^2$
		2	
VI(2)	Identify shape and applicable formula. Determine the slant height $s = 11.48 \text{ cm}$	M1	slant height: $s^2 = (12)^2 - (3.5)^2$ $s^2 = 144 - 12.25$ $s^2 = 131.75$ $s = 11.48 \text{ cm}$

	Substitute values & calculate SA correctly $SA_{cone} = 164.78 \text{ cm}^2$	A1	$SA = \pi r^2 + \pi rs$ $= \pi (3.5)^2 + \pi (3.5)(11.48)$ $= 38.5 + 126.28$ $= 164.78 \text{ cm}^2$
		2	
VI(3)	Finding the area of lateral face $Area \text{ of lateral face} = 135 \text{ cm}^2$	M1	$Area \text{ of the lateral face} = 6(9 \times 2.5) = 135 \text{ cm}^2$
	Finding the cost of printing , $total \text{ cost} = Nu 33.25$	A1	$Cost \text{ of printing} = 135 \times 0.25 = Nu 33.25$
		2	
VI(4)	Drawing of figure 	M1	Let O be the center of the circle and AB is the tangent. $OB \perp AB$ then $\triangle OAB$ is a right-angled triangle
	Hence, the radius of the circle = 3 cm	B1	$OA^2 = AB^2 + OB^2$ (by Pythagoras Theorem) $5^2 = 4^2 + OB^2$

			$OB^2 = 5^2 - 4^2$ $= 25 - 16$ $OB^2 = 9$ $OB = \sqrt{9} = 3$
		2	
VI(5)	Finding the volume of Sphere $V_{\text{sphere}} \approx 113.1\text{cm}^3$	M1	$V_{\text{sphere}} = \frac{4}{3}\pi r^3$ $= \frac{4}{3}\pi(3)^3 \text{ --- [0.5]}$ $\approx 113.1\text{cm}^3 \text{ --- [0.5]}$
	Using the given condition and finding the height of cylinder. $h \approx 4\text{ cm}$	A1	$V_{\text{cylinder}} = 113.1$ $\pi r^2 h = 113.1$ $\pi(3)^2 h = 113.1$ $h = \frac{113.1}{9\pi}$ $h \approx 4\text{ cm}$
		2	