



INTERNATIONAL SECONDARY CERTIFICATE EXAMINATION
NOVEMBER 2023

QUANTITATIVE REASONING: PAPER II

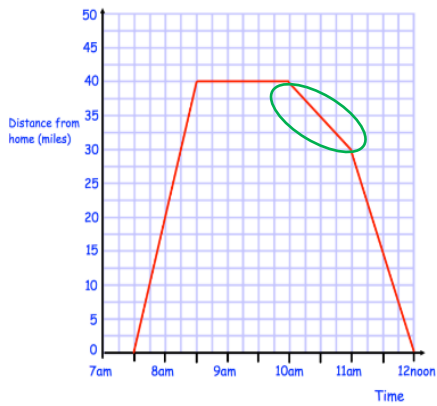
MARKING GUIDELINES

Time: 3 hours

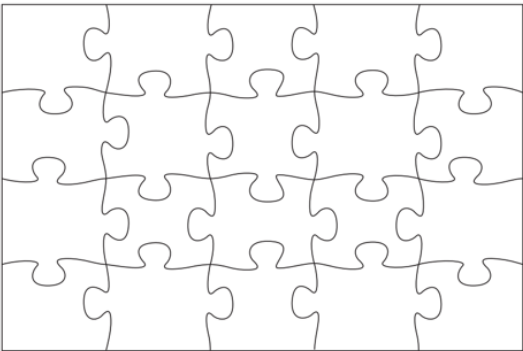
150 marks

These marking guidelines are prepared for use by examiners and sub-examiners, all of whom are required to attend a standardisation meeting to ensure that the guidelines are consistently interpreted and applied in the marking of candidates' scripts.

The IEB will not enter into any discussions or correspondence about any marking guidelines. It is acknowledged that there may be different views about some matters of emphasis or detail in the guidelines. It is also recognised that, without the benefit of attendance at a standardisation meeting, there may be different interpretations of the application of the marking guidelines.

Q1	Marking guideline	Marks
1.1.1	False	
1.1.2	False	
1.1.3	False	
1.1.4	False	
1.1.5	True	
1.2	$0,45 \times 60 = 27$ 7h 27 min (Penalise 1 if ° ' ' used)	
1.3	6	
1.4	$420 \text{ ml} - 160 \text{ ml} = 260$	
1.5.1	7:30 am	
1.5.2	40 miles	
1.5.3	1,5 hours / 1hr 30 min	
1.5.4		
1.6.1	$5 \times 60 = 300 \text{ cm}$	
1.6.2	$300 \text{ cm} \div 100 = 3 \text{ m}$	

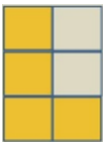
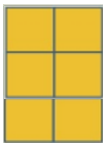
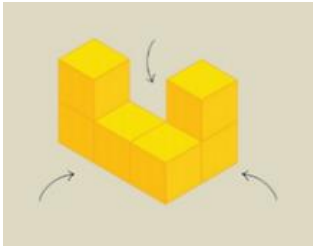
Q2	Marking guideline	Marks
2.1	$8 \text{ h } 35 \text{ min} = 8,5833 \text{ h}$ $1 \div 8,5833 \text{ h} \times 1\,000 = 116,5 \text{ pieces per hour.}$ Accept 116 / 117 OR $1\,000 \div 8,5833 = 116,5 \text{ pieces per hour}$ Accept 116 / 117 OR $8\text{h}35 \text{ min} = 515 \text{ minutes}$ $1000 \div 515 = 1,94 \text{ pieces per min}$ $1,94 \times 60 = 116,4$ Accept 116/117	
2.2.1	$\frac{4}{1\,000} = 0,004$	
2.2.2	$\frac{4}{999}$	
2.3.1	$40 \text{ cm} : 15,7 \text{ in}$ $1 \text{ cm} = 0,3925 \text{ [Accept } 0,4; 0,39; 0,393]$ OR $50 \text{ cm} : 19,7 \text{ in}$ $1 \text{ cm} = 0,394 \text{ [Accept } 0,4; 0,39]$	
2.3.2	$40 \text{ cm} \div 2 \text{ cm} = 20 \text{ pieces along width}$ $50 \text{ cm} \div 2 \text{ cm} = 25 \text{ pieces along length}$ $20 \times 25 = 500 \text{ pieces}$	
2.4	$25 \text{ cm} - 1,25 \text{ cm} - 1,25 \text{ cm} = 22,5 \text{ cm}$ $18 \text{ cm} - 2,5 \text{ cm} = 15,5 \text{ cm}$ $22,5 \text{ cm} \times 15,5 \text{ cm}$	

2.5	$A = 3$ $B = 4 \text{ or } 5$ $C = 1$ $D = 5 \text{ or } 4$ 	
2.6	At robots turn right. Enter estate. At first circle go straight (2nd exit) along St Lucia Blvd At next / second circle turn right (3rd exit) into Minsmere Rd Left into Domic Rd Right into Ashmore Rd Right into Laurent Rd Friend on left / about halfway along road OR At first circle go straight (2nd exit) along St Lucia Blvd At next / second circle turn right (3rd exit) into Minsmere Rd Left into Codrington Rd Left into Ashmore Rd Left into Laurent Rd Friend on left / about halfway along road OR At 1st circle right into Everglades Left into Domic Rd Right into Ashmore Rd Right into Laurent Rd Friend on left / about halfway along road OR At 1st circle right into Everglades Left into Domic Rd Right into Minsmere Rd Left into Codrington Rd Left into Ashmore Rd Left into Laurent Rd Friend on left / about halfway along road	

Q3	Marking guideline	Marks
3.1.1	11:25 pm to 10:35 am 11:25 to 00:00 = 35 min 00:00 to 10:35 = 10h35 min = 11 hours 10 min	
3.1.2	10:35 am + 5 hr 40 min 16:15	
3.2.1	Dover	
3.2.2	412 miles	
3.3.1	3 parts	
3.3.2	Kirk Yetholm	
3.3.3	Fort William [Accept Maryhill Locks]	
3.3.4	9,1 miles $\times$ 1,609 = 14,6419 km 14,6419 km $\times$ 100 000 = 1 464 190 cm 15,5 cm : 1 464 190 cm $\div$ 15,5 1 cm : 94 463,87 cm 1 : 94 000	
3.4	...10:26 – 10:56 – 11:26 – 11:56... 11:26 – 11:15 = 11 minutes	

Q4	Marking guideline	Marks
4.1	$\text{Area} = \pi \times 4^2 = 50,265... \approx 50 \text{ m}^2$	
4.2.1	$8 \text{ m} + 2 \text{ m} + 2 \text{ m} = 12 \text{ m}$	
4.2.2	$C = \pi \times 12 = 37,6991... \text{ m} / 37,704 \text{ m}$ $37,7 \text{ m} - 1 \text{ m} \approx 36,7$	
4.3.1	$\text{Volume} = \pi \times 4^2 \times 1,5 \text{ m} = 75,398... \text{ m}^3 / 75,408 \text{ m}^3$ $75,398... \text{ m}^3 \times 1\,000 = 75\,398,22 \text{ litres} \approx 75\,400 \text{ litres}$	
4.3.2	$75\,400 \text{ litres} \div 15 = 5\,026,7 \text{ minutes}$ $5\,026,7 \div 60 = 83,778 \text{ hours} \div 24 = 3,49 \text{ days}$ OR $75\,400 \text{ litres} \div 15 = 5\,026,7 \text{ minutes}$ $5\,026,7 \div (24 \times 60) = 3,49 \text{ days} / 3,5 \text{ days}$ OR $3 \text{ days} \times 24 = 72 \text{ hours}$ $72 \text{ hours} \times 60 = 4\,320 \text{ minutes}$ $4\,320 \times 15 = 64\,800 \text{ litres}$ Conclusion must compare litres.	
4.4	Calculation 2: $(\pi \times 6^2) - (\pi \times 4^2)$	
4.5	$(32^\circ\text{F} - 32) \times \frac{5}{9} = 0^\circ\text{C}$ $(78^\circ\text{F} - 32) \times \frac{5}{9}$ $\approx 25,56$	

Q5	Marking guideline	Marks
5.1.1	NE	
5.1.2 (a)	Speed = Distance ÷ Time = 190 km ÷ 2,5 h = 76 km/h	
(b)	08:00 + 2,5 h + 45 min = 08:00 + 3h15min = 11:15	
(c)	65 km/h	
5.2.1 (a)	12 rooms – 2 rooms = 10 rooms for the choir members 25 – 15 = 10 males Female : Male 15 : 10 3 : 2 Males = $\frac{2}{5} \times 10$ OR $\frac{10}{25} \times 10$ = 4 rooms for the males [6 rooms for the females]	
(b)	Any two options: 1, 2, 3, 4 1, 1, 4, 4 2, 2, 3, 3 2, 2, 2, 4 3, 3, 3, 1	
5.2.2	Yes. There is a doorway / entrance / gate shown on the right of the patio.	
5.2.3	To the left of the floor plan, we see the start of a passage and parts of two bathrooms. OR There are stairs to the left of the restroom showing that there is another floor. OR Any reasonable valid reason.	
5.3.1	4 people: $\frac{1}{4}$ teaspoon 2 people: $\frac{1}{8}$ teaspoon 6 people: $\frac{3}{8}$ teaspoon OR 4 people : $\frac{1}{4}$ tsp 6 people : x tsp $x = 6 \div 4 \times \frac{1}{4}$ $x = 0,375$ tsp	

5.3.2	Mince 500 g : 4 people 400 g = 3,2 people / 3 people Stock 4 people : 150 ml 3,2 people = 120 ml / 112,5 ml OR 150 ml : 500 g X ml : 400 g $X = 400 \div 500 \times 150$ $X = 120$ ml OR 150:500 1 : x $X = 3.33$ $400 \div 3.33 = 120,12$ml	
5.3.3	0,5 litres	
5.3.4	$\frac{150}{500}$ OR $\frac{3}{10}$	
5.4	 Plan view  None of these  Front elevation  Side elevation 	
5.5	Round 1 = $\frac{12}{16}$ (Accept $\frac{3}{4}$) Semi-finals = $\frac{2}{4}$ (Accept $\frac{1}{2}$) Finals = $\frac{1}{2}$	

Total: 150 marks