



INTERNATIONAL SECONDARY CERTIFICATE EXAMINATION
MAY 2024

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.

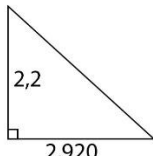
NOTE:

- 1 Alternate methods will be addressed at marking.
- 2 Scale question answers will be finalised with final draft

Q1	Marking guideline			
KEY	a	accuracy	ca	continued accuracy
	m	method	ma	method accuracy
	mca	method continued accuracy	r	rounding
1.1	$231\,626 \div 169 \text{ km}^2$ $= 1\,370,568$			
1.2.1	11			
1.2.2	Shopping			
1.2.3	(a) 7,6 cm (Accept 7,5 – 7,7 cm) (b) 3 cm : 2 km $x = 7,6 \div 3 \times 2$ $x = 5,06666 \text{ km}$ (Accept 5; 5,1; 5,07; etc.)			
1.2.4	17 min = 0,28h (Accept $\frac{17}{60}$ hrs)			
1.3.1	20 m			
1.3.2	$20 - (-10)$ $= 20 + 10$ $= 30 \text{ m}$			
1.4.1	Sunday			
1.4.2	$26^\circ - 12^\circ$ $= 14^\circ$			
1.4.3	12°C Accept $12 \leq x \leq 13$			
1.4.4	$27^\circ\text{C} = \frac{5}{9}(\text{°F} - 32)$ $48,6 = \text{°F} - 32$ $\text{°F} = 80,6$ OR $\text{°F} = \frac{9}{5} \times 27 + 32$ $\text{°F} = 48,6 + 32$ $\text{°F} = 80,6$			
1.5	A. Decreases B. 0,5°C per 152,4 m OR 152,4 m per 0,5°C C. 304,8 / 305 D. 101°C or 215°F E. Increases F. Below			

Q2	Marking guideline	
KEY	a accuracy m method mca method continued accuracy	ca continued accuracy ma method accuracy r rounding
2.1	12 bees : 1 tsp 12 bees : 5 g $375 \text{ g} \div 5 \times 12$ = 900 bees	
2.2.1	pounds	
2.2.2	32500×683 bees = 222 31650 miles $222\,31650 \text{ miles} \div 0.621371$ = 35 778 383,61km	
2.2.3	$9,5 \text{ oz} \times 29,535$ 280,95 ml = 281 ml	
2.3	$12 \div 0,621371$ = 19,312 19,312 km/h	
2.4.1	$A = \frac{180(4)}{6}$ = 120°	
2.4.2	$P = 6 \times 3,1$ = 18,6 mm	
2.4.3	$A = \frac{3\sqrt{3}}{2} \times 6^2$ = 93,53 mm ²	
2.4.4	$V = 93,53 \times 20$ = 1 870,6 mm ³ = 1,8706 ml (÷1000)	

2.4.5	$A_{\text{hexagon}} = 93,53 \text{ mm}^2$ $P_{\text{hexagon}} = 18,6 \text{ mm}$ $A_{\text{square}} = 9,61 \text{ mm}^2$ $P_{\text{square}} = 12,4 \text{ mm}$ $A_{\text{triangle}} = \frac{1}{2}(3,1)(2,7)$ $= 4,185 \text{ mm}^2$ $P_{\text{triangle}} = 3(3,1)$ $= 9,3 \text{ mm}$ $A_{\text{circle}} = 3,14 \times 1,55^2$ $= 7,54 \text{ mm}^2$ $P_{\text{circle}} = 3,14 \times 3,1$ $= 9,734 \text{ mm}$ $\therefore$ hexagon provides a large area for a small perimeter
2.5	2.5.1 D 2.5.2 F 2.5.3 B 2.5.4 G 2.5.5 C 2.5.6 E 2.5.7 A

Q3	Marking guideline			
KEY	a accuracy		ca continued accuracy	
	m method		ma method accuracy	
	mca method continued accuracy		r rounding	
3.1.1	5			
3.1.2	Western elevation			
3.1.3	8 170 – 4 200 – 3 420 – 110 = 440 ∴ 440 ÷ 2 = 220 mm			
3.1.4	8,1 / 8,2 / 8,3 cm			
3.1.5	8,1 cm : 817 cm 1 : 101			
	8,2 cm : 817 cm 1 : 100			
	8,3 cm : 817 cm ^{ion} 1 : 98			
3.2.1	7730 ÷ 1000 = 7.73m (7.73m ÷ 1.2) +1 = 7,442 So 8			
3.2.2	 Slant = $\sqrt{2,92^2 + 2,2^2}$ = 3,656 m ∴ 3,656 × 2 = 7,312 m 7,312 m × 8 = 58.496 m			

Q4	Marking guideline	
KEY	a accuracy m method mca method continued accuracy	ca continued accuracy ma method accuracy r rounding
4.1.1	$2 \times 3 = 6$ tsp	
4.1.2	$319 \text{ g} : 2\frac{2}{3} \text{ cups}$ $119,625 \text{ g} = 1 \text{ cup}$	
4.1.3	$1 \text{ can} : 12 \text{ people}$ $25 \text{ cans} : 300$	OR $300 \div 12 = 25 \text{ cans}$
4.2.1	Sides : $30 \text{ cm} \div 7,5$ = 4 along L & W Height : $32 \div 11$ = 2,9 = 2 on top of each other $\therefore 4 \times 4 \times 2$ = 32 cans	
4.2.2	Dimensions box $32 \times 30 \times 30$ Closest dim $33,7 \times 32,2 \times 34,5$ Weight $380 \text{ g} \times 32 = 12\,160\text{g}$ = 12,16 kg = 12,16 kg < 12,5 Cost R2 530	
4.2.3	$A = (2 \times \pi \times 37,5) \times 110$ = 25 918,14 mm ² = 259,18 cm ² OR $\pi \times 75 \times 110$ 25 918,14 mm ² = 259,18 cm ²	
4.3.1	$\frac{1}{3} \times \frac{1}{3} = \frac{1}{9}$	
4.3.2	$\frac{1}{9} + \frac{1}{3} =$ $(1/3 \times 1/3) + 1/3 = 4/9$	

Q5	Marking guideline			
KEY	a	accuracy	ca	continued accuracy
	m	method	ma	method accuracy
	mca	method continued accuracy	r	rounding
5.1.1	10 000 km × 1 000 = 10 000 000 m			
5.1.2	50 km –20 km = 30 km			
5.2.1	A	North		
	B	Southeast		
5.2.2	Southwest			
5.2.3	20:12 – 2:10 = 18:02			
5.2.4	(a)	881 miles = 1 417 km 1 mile = 1,61 km		
	(b)	$S = 1\,417 \div 2\frac{10}{60}(2.177 \dots)$ = 654 km/h		
	OR	$S = 1\,417 \div 2,17$ = 652,995 km/h		
5.3.1	2 hr 10 min = 130 min × 60 = 7 800 sec 7 800 × 4 = 31 200 ℓ			
5.3.2	31 200 ℓ × R15,27 = R476 424			

5.3.3	(a) $477\,000 \div 3\,679$ $= 129,65$ ≈ 130 (b) $477\,000 \div 98$ $= 4\,867,35$ (c) $\frac{2}{3} \times 98 = 65,3$ $65,3 \times 20 = 1\,306,67\text{kg}$ $0,96 \times 98 = 94,08$ $94,08 \times 8 = \underline{752,64}$ $1306,67 + 752,64 = 10\,487,31 \text{ kg}$ OR $\frac{2}{3} \times 98 \times 20 = 1\,306,67 \qquad 1\,307$ $0,96 \times 98 \times 8 = \underline{752,64} \qquad \underline{753}$ $10\,487,31 \text{ kg} \qquad 10\,488 \text{ kg}$
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Total: 150 marks