



Annual Examinations for Secondary Schools 2022

YEAR 9	MATHEMATICS TRACK 2	MARKING SCHEME
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Notes for Marking of Scripts

Types of Marks

Method marks are awarded for knowing a correct method of solution and attempting to apply it. Method marks cannot be lost for arithmetic mistakes. They can only be awarded if the method used would have led to the correct answer had not an arithmetic mistake been made. Unless otherwise stated, any valid method not specified in the marking scheme is to be accepted and marked accordingly.

There are two types of Method marks, **M** marks and **(M)** marks.

- **M marks**, are only awarded if method is seen.
- **(M) marks** are awarded even when a correct answer is given and no work is shown.

There are two types of Accuracy marks, **A** marks and **B** marks.

- **A** marks are accuracy marks given for correct answer only (c.a.o.).
 - * Incorrect answers, even though nearly correct, score no marks.
 - * Accuracy marks are also awarded for incorrect answers which are correctly followed through (f.t.) from an incorrect previous answer, **provided that f.t. is indicated in the marking scheme**.
 - * No Method marks **M/(M)** or Accuracy marks **A**, are awarded when a wrong method leads to a correct answer.
 - * When a question is assigned **M** and **A** marks and students present a correct answer without any working, only **A** marks are awarded.
- **B** marks are accuracy marks awarded for specific results or statements independent of the method used.

Misreading

Method marks can still be earned (unless that part of the question is trivialised) but the final Accuracy marks are lost.

Crossed out working

An answer or working that is crossed out and not replaced is marked as if it were not crossed out. If the answer or working is replaced, then the crossed out answer or working is ignored and should not be considered for marking.

Units

In general, missing or inaccurate units are not penalised unless otherwise indicated in the marking scheme.

Other

- Incorrect working or statement following a correct answer is ignored.
- Marks are not sub-divisible; no half marks may be awarded.
- Other abbreviations used:
 - * o.e. (or equivalent)
 - * e.e.o.o. (each error or omission)
- Markers are advised to indicate the **M**, **(M)**, **A** or **B** marks awarded in the body of the script and then write their total in the margin. The total mark for each question should be written in the table included at the top of page 1 of the main paper. This measure facilitates the moderation of papers.

NON CALCULATOR PAPER (25 marks)

Ques.		Requirements	Mark		Additional Guidance
1.	a)	i) 420 ii) 610	B1 B1 f.t.	5	
	b)	$\frac{5}{3} - \frac{7}{9}$ $\frac{15}{9} - \frac{7}{9}$ $\frac{8}{9}$	M1 M1 A1		
2.		$\frac{30^2}{200 - 100}$ <i>or</i> $\frac{30^2}{220 - 100}$ $\frac{900}{100}$ $\frac{900}{120}$ 9 7.5	M1 M1 A1	3	
3.	a)	$-11 - 2 + 15$ 2	(M)1 A1	4	
	b)	4×-3 -12	(M)1 A1		
4.		Measuring: AC = 6.5 cm; AB = 3.25 cm; BC = 4.0 cm Total distance: 6.5 + 3.25 + 4.0 13.75 cm Actual distance: 13.75 × 10 137.5 km	B2 (M)1 A1 f.t. M1 A1	6	(± 0.1 cm) B1 if at least 2 correct (± 0.2 cm) (± 2 km) f.t. from measuring
5.		$k + 4n = 2m$ $m = \frac{k + 4n}{2}$	M1 A1	2	
6.	a)	$\frac{30}{100} \times 40$ 12	M1 A1	5	
	b)	$\frac{1}{4} \times 40 = 10$ 40 - (12 + 10) 18	(M)1 (M)1 A1 f.t.		

MAIN PAPER (75 marks)

Ques.		Requirements	Mark		Additional Guidance																						
1.	a)	i) 5 : 11 : 20 ii) 60 : 200 3 : 10	B1 M1 A1	6																							
	b)	2 + 3 + 1 + 4 = 10 parts 360 ÷ 10 = 36 36 × 4 = 144°	(M)1 (M)1 A1																								
2.	a)	$\frac{1}{4}$	B1	6	o.e.																						
	b)	60	B1																								
	c)	460 ÷ 10 46	M1 A1		Correct total																						
	d)	Writing numbers in order of size 50	(M)1 A1																								
3.	a)	i) Start from 49 subtract 11 ii) Start from 100 divide by 2	B1 B1 B1 B1	9																							
	b)	<table border="1"> <thead> <tr> <th>Pattern number</th><th>1</th><th>2</th><th>3</th><th>4</th><th>7</th></tr> </thead> <tbody> <tr> <td>White rectangles</td><td></td><td></td><td>3</td><td>4</td><td>7</td></tr> <tr> <td>Grey rectangles</td><td></td><td></td><td>10</td><td>13</td><td>22</td></tr> <tr> <td>Total rectangles</td><td></td><td></td><td></td><td>17</td><td>29</td></tr> </tbody> </table> <p>For 3 and 10 in Pattern 3 both correct For 4 and 13 in Pattern 4 both correct For 7 in Pattern 7 For 22 in Pattern 7 For totals 17 and 29 both correct</p>	Pattern number		1	2	3	4	7	White rectangles			3	4	7	Grey rectangles			10	13	22	Total rectangles				17	29
Pattern number	1	2	3	4	7																						
White rectangles			3	4	7																						
Grey rectangles			10	13	22																						
Total rectangles				17	29																						
4.	a)	$C = 2\pi r$ $= 2 \times \pi \times 4$ $= 25.132... \text{ cm}$	(M)1 M1 A1	6	Accept 25 or more accurate																						
	b)	$A = \pi r^2$ $= \pi \times 4^2$ $= 50.2654... \text{ cm}^2$	(M)1 M1 A1		Accept 50 or more accurate																						

5.	a)	<table><tr><th>Height, h (in cm)</th><th>Tally</th><th>Freq</th></tr><tr><td>$120 < h \leq 130$</td><td>/</td><td>1</td></tr><tr><td>$130 < h \leq 140$</td><td>### /</td><td>6</td></tr><tr><td>$140 < h \leq 150$</td><td>### ///</td><td>8</td></tr><tr><td>$150 < h \leq 160$</td><td>////</td><td>4</td></tr><tr><td>$160 < h \leq 170$</td><td>///</td><td>3</td></tr><tr><td>Total</td><td></td><td>22</td></tr></table>	Height, h (in cm)	Tally	Freq	$120 < h \leq 130$	/	1	$130 < h \leq 140$	### /	6	$140 < h \leq 150$	### ///	8	$150 < h \leq 160$	////	4	$160 < h \leq 170$	///	3	Total		22	B4	7	-1 e.e.o.o.
		Height, h (in cm)	Tally	Freq																						
		$120 < h \leq 130$	/	1																						
		$130 < h \leq 140$	### /	6																						
		$140 < h \leq 150$	### ///	8																						
$150 < h \leq 160$	////	4																								
$160 < h \leq 170$	///	3																								
Total		22																								
	b)																									
		Correct drawing of bar chart	B2 f.t.		-1 e.e.o.o. f.t. from (a)																					
		c)	7		B1 f.t.	f.t. from (a)																				
		6.	a)	$18x + 24$	B2	7	B1 for each correct term																			
b)	$9x$		B1																							
c)	$8(x^2 - 2)$		B2	B1 for partial factorisation																						
d)	$2(22) - 4(3)$ $44 - 12$ 32		M1 A1																							
7.	a)	Correct plotting of coordinates	B3	7	-1 e.e.o.o.																					
	b)	i) 2 ii) -2	B1 B1																							
	c)	Calculating gradient using any two points 3	M1 A1																							

8.	a)	$(19 \times 5) \times 2 = 190$ $(14 \times 5) \times 2 = 140$ $(14 \times 19) \times 2 = 532$ Surface area = 862 cm^2	M1 M1 M1 A1	10	
	b)	i) $3x + 4 = 19$ $3x = 19 - 4$ $x = 15 \div 3$ $x = 5$ ii) $2y - 5 = 14$ $2y = 14 + 5$ $y = 19 \div 2$ $y = 9.5$	M1 (M)1 A1 M1 (M)1 A1		For equation For equation
9.	a)	\$6	B1	3	
	b)	$\frac{32 \times 5}{6}$ €26.67	M1 A1		Accept answers between €25.50 and €26.80
10.	a)	$\frac{11}{12} \times 60$ 55 cm	M1 A1	8	
	b)	$120 \times 40 \times 55$ $264\,000 \text{ cm}^3$	M1 A1 f.t.		f.t. from (a)
	c)	$264\,000 \div 1000$ 264 litres	(M)1 A1 f.t.		f.t. from (b)
	d)	$264 \div 22$ 12 min	(M)1 A1 f.t.		f.t. from (c)
11.	a)	i) Construction of line AB: 8 cm ii) Construction of 60° angle (arcs seen) at A iii) Construction of line AC: 7 cm Accurate triangle ABC	M1 M1 M1 A1	6	$(\pm 0.1 \text{ cm})$ $(\pm 1^\circ)$ $(\pm 0.1 \text{ cm})$
	b)	i) 7.5 cm ii) 53°	A1 A1		$(\pm 0.2 \text{ cm})$ $(\pm 2^\circ)$