DEPARTMENT FOR CURRICULUM,
LIFELONG LEARNING AND EMPLOYABILITY
Directorate for Learning and Assessment Programmes
Educational Assessment Unit

Track 2

Annual Examinations for Secondary Schools 2022

YEAR 11 MATHEMATICS MARKING SCHEME

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 (20 marks – 1 mark each)

1	2	3	4	5	6
0.871, 0.9, 1.9, 2.327	$\frac{2}{9}; \frac{7}{9}$	142.80	€16 200	65%	1×10^4

7	8	9	10	11	12	13	14
1, 3	a value between 5.8 and 7	16; 22	$20\pi + 40$	900	23.5	€21.50	10 cm

15	16	17	18	19	20
B	40 m	65 cm^2	30°	4	32

MAIN PAPER (80 marks)

Que.		Requirements	Mark		Additional Guidance
1	a	3	B1	3	
	b	$y = 3x + 5$	B2		B1 for correct gradient; B1 for correct intercept
2	a	i) $3(x - 2)$ ii) $9x(x - 2)$	B1 B2	4	 B1 for each correct factor
	b	$\frac{1}{3x}$	B1		
3	a	i) 24.50×0.18 4.41 ii) 4.41 + 24.50 = 28.91	M1 A1 A1 f.t.	6	 ft from i)
	b	227 ÷ 1.18 192.37	M2 A1		1 mark for seeing 1.18 o.e.
4	a	i) $x + 3$ ii) $2x$ iii) $x + x + 3 + 2x$ $4x + 3$	B1 B1 M1 A1	6	
	b	$4x + 3 = 25$ $4x = 22$ $x = 5.5$	M1 A1 f.t.		
5		5 000 0.00005 0.0005 0.05 50 000	B1 B1 B1 B1 B1	5	

6	a	i) $A = \pi(5r)^2 = 25\pi r^2$ ii) $\frac{A}{25\pi} = r^2$ $r = \sqrt{\frac{A}{25\pi}}$ or $\frac{1}{5}\sqrt{\frac{A}{\pi}}$	M1 M1 A1	8	
	b	i) 13 ii) $2x - 7 = 6$ $x = 6.5$ iii) $2x - 7 = 5x + 2$ $-3x = -9$ $x = -3$	B1 M1 A1 M1 A1		
7	a	Total number of pupils is 533 UK $\frac{190}{533} \times 360$ 128° Bulgaria 68° Italy 66° Syria 55° Libya 43° Drawing at least 3 sectors correctly All sectors drawn correctly and labelled by nationality	 M1 A1 A1 M1 A1	9	 for finding any one angle for one angle correct for at least 2 correct angles $\pm$ 2°
	b	$\frac{100}{533}$	B1		
	c	UK; Libya	B1		both correct
	d	No because if other pupils increase or decrease in number, the angle could also be the same or even smaller	B1 M1		
8	a	Tan ∠BAC = $\frac{2.7}{5.2}$ = 0.5192307692… ∠BAC = 27.43972795… = 27°	M1 (M)1 A1	7	
	b	4 – 2.7 = 1.3 $AD^2 = 5.2^2 + 1.3^2$ $27.04 + 1.69 = AD^2$ $28.73 = AD^2$ 5.36 m = AD	(M)1 M1 (M)1 A1		

9	a	BY : YQ = 5 : 15 = 1 : 3 AY : YP = 6.4 : 19.2 = 1 : 3 ∠BYA = ∠PYQ (vertically opp. angles) ΔABY is similar to ΔPQY since two pairs of sides are in the same ratio and the included angle is equal.	M1 M1 A1	8	comparing two pairs of sides
	b	7 × 3 21 cm	(M)1 A1 f.t.		f.t. from part a)
	c	∠BAY = 180° – (68° + 72°) ∠BAY = 40° ∠YPQ = ∠BAY = 40° (similar Δs)	M1 A1		
	d	Since triangles are similar all corresponding angles are equal. In particular ∠YPQ = ∠BAY (and ∠YQP = ∠ABY). Since angles in the same segment are equal, A,B,P and Q lie on a circle.	M1		
10	a	i) (5.5 × 2) + (0.75 × 3) 13.25 mg ii) A 17-year old female needs 1.75 mg more iron. If we decide to add **spinach**, we need at least $\frac{100\times1.75}{2.8}$ 62.5 g. OR If we decide to add **potatoes**, we need at least $\frac{100\times1.75}{0.8}$ 218.75 g.	M1 A1 M1 A1	8	 Accept 60 g or more accurate Accept 220 g or more accurate
	b	i) $\frac{5}{9}$ × 100% = 55.555…% ii) $\frac{3.5}{5}$ × 100% = 70%	M1 A1 M1 A1		accept 56% or more accurate

<table>
<tr><td rowspan="2">11</td><td>a</td><td>∠DMA = ∠CNB (90°, given)
∠DAM = ∠BCN (alternate angles)
AD = BC (sides of parallelogram)

ΔADM ≡ ΔCBN by AAS</td><td>M3

A1</td><td rowspan="2">5</td><td>Award 2 marks if one reason is missing or incorrect.
Award 1 mark if two or three reasons are missing or incorrect</td></tr>
<tr><td>b</td><td>Side NC = x cm
$20 - 2x$</td><td>B1</td><td>o.e.</td></tr>
<tr><td rowspan="4">12</td><td>a</td><td>400 g</td><td>B1</td><td rowspan="4">11</td><td></td></tr>
<tr><td>b</td><td>€16.50</td><td>B1</td><td></td></tr>
<tr><td>c</td><td>No
Valid explanation e.g. because the graph does not start from 0; e.g. because for example a 200 g parcel costs €14 while 400 g costs €15, which is not double the cost</td><td>B1

M1</td><td></td></tr>
<tr><td>d</td><td>i)<table><tr><th>W</th><th>200</th><th>400</th><th>800</th></tr><tr><td>15</td><td>15</td><td>15</td><td>15</td></tr><tr><td>+0.005W</td><td>1</td><td>2</td><td>4</td></tr><tr><td>C</td><td>16</td><td>17</td><td>19</td></tr></table>ii) A straight line passing through (200,16) and (800,19)

iii) 600; 18

iv) Fast Company
Valid explanation e.g. because after 600 g Fast Company is cheaper.</td><td>B2

B1

B2

B1
M1</td><td>B1 for every 3 correct entries

Accept also answers such as “we do not know whether Express Company will continue with the same pattern after 1 kg so we cannot tell whether it will be cheaper or not.”</td></tr>
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