DIRECTORATE FOR QUALITY AND STANDARDS IN EDUCATION
Department of Curriculum Management
Educational Assessment Unit

Track 3

Annual Examinations for Secondary Schools 2016

FORM 3 MATHEMATICS MARKING SCHEME

Notes for Marking of Scripts

Types of Marks

- **M**(ethod) 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. In general a correct method is implied by a correct answer and therefore **when a correct answer is given and no work is shown, no method marks are lost**.
- **A**(ccuracy) marks are 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 (M) or accuracy (A) marks are awarded when a wrong method leads to a correct answer.
- **B** marks are accuracy marks awarded for specific results or statements independent of the method used.

Misreading

M marks can still be earned (unless that part of the question is trivialized) but the final A marks are lost.

Crossed out working

An answer or working that is crossed out and not replaced is marked as if it was 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.

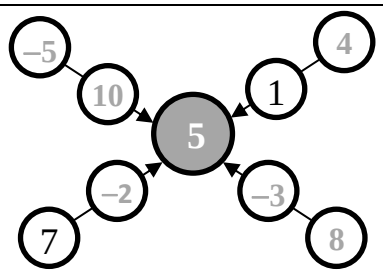
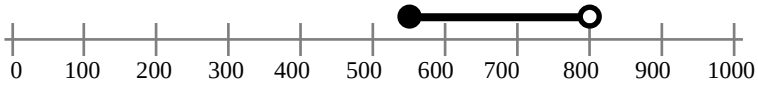
Units

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, 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)

Question No.		Requirements	Marks	
1.		$27.2 \times 3.45 = 93.84$ $213.5 \div 5.21 = 40.98$ *Award B1 for just one correct match* $\frac{38.1 + 2.31}{4.2} = 9.62$	B2	2
2.	a	$\frac{6}{23}$	B1	4
	b	2	B1	
	c	2	B1	
	d	4	B1	
3.		 1 7	B1 B1	2
4.	a	3	B1	3
	b	*Attempt at reading values at y = 8 seen or implied* –2.2, 2.2 *Both seen*	M1 A1	
5.	a	 *Filled in circle at 550* *Empty circle at 800*	B1 B1	4
	b	A and C *Award marks only if both are correct*	B2	
6.	a	$\frac{5}{7} \times 28$ *Or any other valid method seen or implied* 20	M1 A1	5
	b	$\frac{5}{6} \times \frac{4}{5} = \frac{2}{3}$ $\frac{1}{5} + \frac{2}{3} = \frac{3}{15} + \frac{10}{15} = \frac{13}{15}$ $\frac{2}{15}$	M1 M1 A1	
7.	a	$3^5 \div 3^2 = 3^3$ $\times \quad \div$ $3 \div 3^2 = 3^{-1}$ $= \quad =$ $3^6 \quad 3^0$	B1 B1	5
	b	i. 3^0 ii. 3^{-1} iii. 3^5 *Accept* $3^3 \times 3^2$	B1 B1 B1	

Main Paper (75 marks)

1.	a	i. Edmond *Accept also 21.34 s*	B1	5
		ii. $\frac{200}{21.34}$	M1	
		9.4	A1 f.t.	
	b	$\frac{134.22}{6}$ *Valid attempt at adding all values and dividing by 6*	M1	
		22.37	A1	
2.	a	h = 27.2 cm	B1	4
	b	$V = \pi \times 3.4^2 \times 27.2$ *Both radius and formula seen or implied*	M1	
		988 cm^3 *Do not penalise if answer is not rounded*	A1	
	c	9.88×10^2	B1 f.t.	
3.	a	360	B1	5
	b	$x = \frac{360}{8} = 45°$ *÷ 8 seen or implied*	M1	
		y = 180 – 45 *Accept any other valid method*	M1	
		= 135	A1	
	c	45 *f.t. for incorrect 45° in (b)*	B1 f.t.	
4.	a	(C) = (A2*B2*C2)/100	B1	3
	b	$\frac{2000 \times 1.5 \times 2}{100}$	M1	
		60	A1	
5.	a	i. 1st sequence: 4, 7, 10, 13, 16, 19	B1	8
		2nd sequence: 1, 5, 9, 13, 17, 21	B1	
		ii. *Valid working seen or implied*	M1	
		(C) both sequences	A1	
	b	i. • Eg. add a white tile on each side *Or any other valid answer*	B1	
		• 3	B1	
		• 2; add 3 o.e. *Both correct*	B1	
		ii. $2n + 3$	B1	
6.	a	i. True	B1	7
		ii. False	B1	
		iii. False	B1	
		iv. Not Sure	B1	
		v. True	B1	
	b	$\frac{80}{360} \times 72$ *Award M1 if angle is not accurately read*	M1	
		16	A1	
7.		*Valid attempt at finding the value of x*	M1	4
		$x = 5$	A1	
		Valid attempt at finding the value of y	M1	
		$y = 2$ *f.t. for incorrect value of first variable found*	A1 f.t.	
8.	a	6.4 (±0.1 cm) × 200	M1	3
		1280 m (±20 m)	A1	
	b	40° (±2°)	B1	

9.	a	90; Angles in semicircle are equal to 90° o.e.	B1 B1	7
	b	$\sqrt{8^2 + 11^2}$	M1	
		13.6	A1	
	c	*Using any trigonometric function correctly*	M1	
		$\text{Tan}^{-1}\left(\frac{11}{8}\right)$ o.e.	M1	
		54 *f.t. if AB is used*	A1	
10.	a	i. *Any valid attempt at finding the gradient seen or implied*	M1	7
		-1	A1	
		ii. *Correct intercept seen*	M1	
		$y = 3 - x$ o.e.	A1	
	b	*Any two points correctly identified and plotted*	M1	
		Correct straight line	A1	
	c	$x = 1$; $y = 2$ *f.t. for incorrect line in (b)*	B1 f.t.	
11.	a	$x^2 - 3x - 10$ *Both x^2 and -10 correct*	B1	9
		$-3x$ correct	B1	
	b	$5p(p + 6q)$ *Valid attempt at factorising seen*	M1	
		Valid attempt at cancelling seen or implied	M1	
		$\frac{p + 6q}{2}$	A1	
	c	*Valid attempt at cancelling seen or implied*	M1	
		$\frac{3e^3f^3}{2}$	A1	
	d	$\frac{x}{2} = y + 5$ *Or any other valid method*	M1	
		$x = 2(y + 5)$ o.e.	A1	
12.	a	$\frac{35}{100} \times 8.45 = €2.96$	M1	5
		$8.45 + 2.96 = €11.41$	M1	
		Award both M marks for any other valid method		
		11.50	A1	
	b	$\frac{270}{1.35}$	M1	
		200	A1	
13.	a	$\frac{100}{2\pi}$ *seen or implied*	M1	8
		15.9 *Do not penalise if answer is not corrected to 3 s.f.*	A1	
	b	i. $\frac{\pi \times 4.6^2}{4}$ *Valid attempt at finding area of circle*	M1	
		Dividing by 4	M1	
		16.6	A1	
		ii. $\frac{\pi \times 2.3^2}{2} = 8.3$	M1	
		$16.6 - 8.3$	M1	
		8.3 *Award final marks only if subtraction is evident*	A1 f.t.	