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**MATHEMATICS (SYLLABUS D)**

**4024/01**

Paper 1

**For Examination from 2018**

SPECIMEN MARK SCHEME

**2 hours**

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**MAXIMUM MARK: 80**

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This document consists of **6** printed pages.

**MARK SCHEME NOTES**

The following notes are intended to aid interpretation of mark schemes in general, but individual mark schemes may include marks awarded for specific reasons outside the scope of these notes.

**Types of mark**

**M** – Method marks are given for a correct method.

**A** – Accuracy marks are given for an accurate answer following a correct method.

**B** – B marks are given for a correct statement or step, independent of method marks.

**Abbreviations**

<b>ag</b>	answer given
<b>art</b>	answer rounds to
<b>cao</b>	correct answer only
<b>dep</b>	dependent
<b>ft</b>	follow through after error
<b>isw</b>	ignore subsequent working
<b>oe</b>	or equivalent
<b>sc</b>	special case
<b>soi</b>	seen or implied
<b>www</b>	without wrong working

Question	Answer	Marks	Part marks
1(a)	$\frac{11}{35}$	1	
1(b)	$\frac{18}{35}$	1	

Question	Answer	Marks	Part marks
2(a)	42	1	
2(b)	4	1	

Question	Answer	Marks	Part marks
3(a)	14	1	
3(b)	0.3 oe	1	

Question	Answer	Marks	Part marks
4(a)	$4.8 \times 10^7$ cao	1	
4(b)	$9.3 \times 10^6$ oe	2	<b>M1</b> for $1.85 \times 10^7 - 9.2 \times 10^6$ oe
4(c)	$5.1 \times 10^8$ cao	1	After 0 in (a) and (c), allow 1 for a correct (c) in any form

Question	Answer	Marks	Part marks
5(a)	$4p(4 + p)$	1	
5(b)	$(x + 2a)(y + 3a)$	2	<b>B1</b> for any partial factorisation
5(c)	$(2x - 5)(x + 4)$	2	<b>B1</b> for $(2x + 5)(x - 4)$ or $(2x - 5)(x - 4)$ or $(2x + 5)(x + 4)$

Question	Answer	Marks	Part marks
6(a)	$\frac{4}{9}$ oe	1	
6(b)	840	1	

Question	Answer	Marks	Part marks
7(a)	$2p + 3q$	1	
7(b)	$2p + 2q$	1	
7(c)	$-2p + q$ ft	1	Accept $3q$ – their (b) ft

Question	Answer	Marks	Part marks
8(a)	4 16 30 52 70 80	1	
8(b)	Correct ft curve	2	<b>B1</b> for at least 5 correct ft points
8(c)	16 to 19 ft	2	<b>B1</b> for their cumulative frequency (CF) at $m = 45$ ft After 0, allow <b>B1</b> for 80 – their CF at $m = 44$

Question	Answer	Marks	Part marks
9(a)	81	1	
9(b)	8	1	
9(c)	$\sqrt{2}$	1	

Question	Answer	Marks	Part marks
10(a)	$\begin{pmatrix} 11 & -6 \\ -1 & -2 \end{pmatrix}$	2	<b>B1</b> for 3 or 2 correct elements
10(b)	$\begin{pmatrix} \frac{1}{2} & 1 \\ \frac{1}{2} & 2 \end{pmatrix}$ or $\frac{1}{2}\begin{pmatrix} 1 & 2 \\ 1 & 4 \end{pmatrix}$	2	<b>B1</b> for determinant $A = 2$ , or for $k\begin{pmatrix} 1 & 2 \\ 1 & 4 \end{pmatrix}$ <b>oe</b>

Question	Answer	Marks	Part marks
11	$-1, -\frac{17}{20}, -\frac{4}{5}, 0, \frac{3}{4}$	2	<b>B1</b> for 4 correct when one is covered or <b>B1</b> for reversed answer

Question	Answer	Marks	Part marks
12(a)	F	1	
12(b)	E	1	

Question	Answer	Marks	Part marks
13	$(a =) 8.75$ <b>oe</b> $(b =) 6$ <b>oe</b>	3	<b>B2</b> for one correct <b>www</b> or <b>B1</b> for $\frac{4}{7}$ or $\frac{7}{4}$ <b>oe</b> seen



Question	Answer	Marks	Part marks
14(a)	$-\frac{5}{8}$ , or $-0.625$ , <b>cao</b>	1	
14(b)	$\frac{7}{2x+3}$ <b>oe</b>	2	<b>B1</b> for $2x'y' + 3x = 7$ <b>oe</b> (condone swaps of $x$ and ' $y$ ') with both variables on the same side.

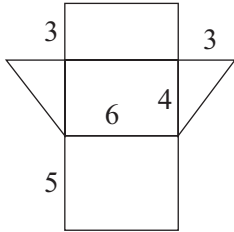
Question	Answer	Marks	Part marks
15(a)	$(R =) 3p^3$ seen	1	
15(b)	4	2	<b>M1</b> for $192 = 3p^3$ <b>oe</b>
15(c)	(Diagram) 2	1	

Question	Answer	Marks	Part marks
16(a)	[0]8 18	1	
16(b)	33	1	

Question	Answer	Marks	Part marks
17(a)	79 <b>cao</b>	1	
17(b)	$n(n + 1) + (n + 2)^2$ <b>oe</b>	1	
17(c)	(A =) 2, (B =) 5, (C =) 4	2	<b>B1</b> for two of these or <b>M1</b> for comparison with <i>their</i> <b>(b)</b>

Question	Answer	Marks	Part marks
18(a)	$\frac{9}{25}$	1	
18(b)	$\frac{3}{t^3}$ or $3t^{-3}$	1	
18(c)	$\frac{x^2}{3y}$ or $\frac{1}{3}x^2y^{-1}$	1	

Question	Answer	Marks	Part marks
19(a)	The correct diagram 	1	
19(b)	The correct diagram 	1	

Question	Answer	Marks	Part marks
20	Completely correct net  (labelling not required)	3	<b>M1</b> for 2 correct rectangular faces <b>M1</b> for another correct triangular face

Question	Answer	Marks	Part marks
21(a)	0.4 <b>oe</b>	1	
21(b)	12 or <i>their</i> <b>(a)</b> $\times 30$ <b>ft</b>	1	
21(c)	0.83	1	

Question	Answer	Marks	Part marks
22(a)	264° to 268° inclusive	1	
22(b)	Acceptable quadrilateral $ABCD$	1	
22(c)(i)	Acceptable perpendicular bisector of $AB$	1	
22(c)(ii)	Acceptable bisector of angle $ABC$	1	
22(d)	Correct region (top left-hand corner) shaded	1	<b>dep</b> on two reasonably accurate intersecting lines

Question	Answer	Marks	Part marks
23	Any number between 4 and 5	2	<b>B1</b> for $x < 5$ , or for $5 > x$ seen This may appear as, e.g. $4 < x < 5$

Question	Answer	Marks	Part marks
24(a)	18	1	
24(b)	4	1	

Question	Answer	Marks	Part marks
25(a)	48°	1	
25(b)	66°	1	
25(c)	24°	1	
25(d)	35° or <i>their</i> $\frac{(a)}{2}$ ft	1	

Question	Answer	Marks	Part marks
26(a)	(-)-2	1	
26(b)	20	1	
26(c)	600	1	
26(d)	40 or $10 + 30 \times \left  \frac{\text{their (a)}}{2} \right $ ft	1	