



MATHEMATICS

0580/23

Paper 2 (Extended)

October/November 2017

MARK SCHEME

Maximum Mark: 70

Published

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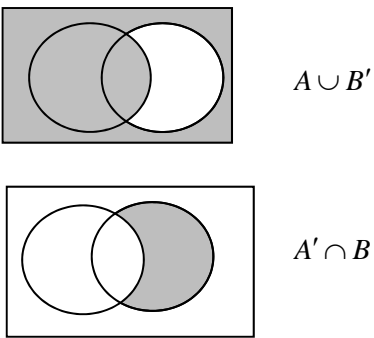
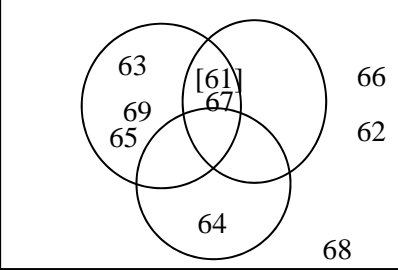
This document consists of **5** printed pages.

Abbreviations

cao	correct answer only
dep	dependent
FT	follow through after error
isw	ignore subsequent working
oe	or equivalent
SC	Special Case
nfww	not from wrong working
soi	seen or implied

Question	Answer	Marks	Partial marks
1	2h 32 min	1	
2	3.06 or 3.056...	1	
3	66.2 or 66.17 to 66.18	1	
4	Kite	1	
5	$9(2x + 3y)$ final answer	1	
6	$\frac{2}{3}$ oe	1	
7	1263.21	2	M1 for $1200 \times \left(\frac{100 + 2.6}{100}\right)^2$ oe
8	87.77.. – 8.77.. oe	M1	Allow $\frac{87-8}{90}$ for M1
	$\frac{79}{90}$	A1	Accept $\frac{79k}{90k}$
9	$x \leq -1.2$ oe final answer	2	B1 for -1.2 oe or M1 for correct step to collect x 's and numbers
10	64.8	3	M2 for $2400 \times 30^3 \div 100^3$ oe or M1 for 30^3 or 0.3^3 soi or <i>their</i> volume $\div 100^3$
11	150	3	M2 for $(12 - 2) \times 180 \div 12$ or $180 - 360 \div 12$ or M1 for $(12 - 2) \times 180$ or $360 \div 12$ soi 30
12	1.1[0]	3	M2 for $0.88 \div \frac{100-20}{100}$ oe or M1 for 0.88 associated with 80 [%]

Question	Answer	Marks	Partial marks
13	$\frac{22}{7}$ or $\frac{5}{4}$ $2\frac{1}{7} - \frac{1}{4}$	B1	Allow $\frac{22k}{7k}$ or $\frac{5k}{4k}$ Correct step for dealing with mixed numbers
	$\frac{88}{28}$ or $\frac{35}{28}$ $2\frac{4}{28}$ or $\frac{7}{28}$	M1	Correct method to find common denominator e.g. $3\frac{4}{28}$ or $1\frac{7}{28}$
	$1\frac{25}{28}$ $1\frac{25}{28}$	A1	
14	$(3x + 5)(x - 4) [=0]$	M2	M1 for $(3x + b)(x + a)$ where $ab = -20$ or $3a + b = -7$
	4 and $-\frac{5}{3}$ oe	A1	If zero scored, SC1 for 2 correct answers from no working or other methods
15	$25x^2 - 8$ final answer	3	M1 for $(5x - 3)^2 + 6(5x - 3) + 1$ M1 for $25x^2 - 15x - 15x + 9$ soi or better
16	$\frac{12m}{p - 4y}$ or $\frac{-12m}{4y - p}$ final answer	4	M1 for $12m + 4xy = xp$ or $3m = \frac{xp}{4} - xy$ M1 for $12m = xp - 4xy$ or $3m = x(\frac{p}{4} - y)$ M1 for $12m = x(p - 4y)$ or $\frac{3m}{\frac{p}{4} - y} = x$ M1 for $\frac{12m}{p - 4y}$ To a maximum of 3 marks for an incorrect answer
17(a)	1, -4 and -9	1	
17(b)	Yes because 13 is an integer oe	3	B2 for $[n =] 13$ or M2 for $\sqrt{((848 - 3) \div 5)}$ or $5 \times 13^2 + 3 [= 848]$ or M1 for $5n^2 + 3 = 848$ oe
18	73.6 or 73.63 to 73.64	4	B3 for 27.4 or 27.36... OR M2 for $\frac{5.9 \sin 79}{12.6}$ oe or M1 for $\frac{\sin[C]}{5.9} = \frac{\sin 79}{12.6}$ oe and M1dep for $180 - 79 - their C$ (dep on at least M1 earned)

Question	Answer	Marks	Partial marks
19(a)	$\begin{pmatrix} 11 & -6 \\ -5 & 6 \end{pmatrix}$	2	M1 for two correct elements
19(b)	$\frac{1}{12} \begin{pmatrix} -6 & 0 \\ -5 & -2 \end{pmatrix}$ oe isw	2	M1 for $k \begin{pmatrix} -6 & 0 \\ -5 & -2 \end{pmatrix}$ ($k \neq 0$) or $\det = 12$ soi
20	139 or 139.2 to 139.3	4	M3 for $10^2 + \frac{1}{2} \times \pi \times 5^2$ or M2 for $\frac{1}{2} \times \pi \times 5^2$ or M1 for radius = 5 or [area of square]10 ²
	cm ²	1	
21(a)	3.4	3	M1 for 2 + 5 + 4 + 2 + 1 + 3 + 2 + 7 + 6 + 2 [34] M1 for <i>their</i> 34 ÷ 10
21(b)	5	2	M1 for 5, 5 identified
21(c)	[Day] 10	1	
22(a)	19	1	
22(b)	138	3	M2 for 180 – (19 + 23) or 67 + (180 – 90 – 19) or better or M1 for angle $AEB = 23$ or angle $AEC = 42$
22(c)	90	2	M1 for angle $EBC = 71$ or angle $EAB = 90$
23(a)	 <p>$A \cup B'$</p> <p>$A' \cap B$</p>	2	B1 for each
23(b)(i)		3	B2 for 6 or 7 correct B1 for 4 or 5 correct

Question	Answer	Marks	Partial marks
23(b)(ii)	3	1FT	FT their $n(E \cup F \cup G)'$
23(b)(iii)	\emptyset or $\{ \}$	1FT	FT their $E \cap F \cap G$