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MATHEMATICS **0580/32**

Paper 3 (Core) **October/November 2017**

MARK SCHEME

Maximum Mark: 104

Published

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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(a)(i)	45	**1**	
1(a)(ii)	10 10	**1**	
1(a)(iii)	[0].55	**2**	**M1** for (1.66 × 5) – 7.75 oe
1(b)(i)	50	**1**	
1(b)(ii)	2, 7, 4, 5, 6, 6	**2**	**B1** for 4 correct in frequency column or **B1** for correct tallies if frequency column blank or **B1** if 2, 7, 4, 5, 6, 6 seen in tally column with frequency column blank or incorrect
1(b)(iii)	Correctly scaled frequency axis	**1**	
	all heights correct	**1FT**	**FT** *their* table
	consistent width of bars	**1**	
1(b)(iv)	10 [to] 19	**1**	**FT** *their* bar chart if 5 or 6 bars or *their* table if no bar chart
2(a)	Eight thousand [and] forty-five	**1**	
2(b)(i)	64	**1**	
2(b)(ii)	61 or 67	**1**	
2(b)(iii)	68	**1**	
2(c)(i)	2×7^2 or $2 \times 7 \times 7$	**2**	**M1** for 2, 7, 7 or 2, 7^2 or $1 \times 2 \times 7 \times 7$ or $1 \times 2 \times 7^2$
2(c)(ii)	14	**2**	**M1** for (182 =) $2 \times 7 \times 13$ or 2, 7, 13 or **B1** for 2 or 7 or 2×7 as final answer

Question	Answer	Marks	Partial Marks
2(d)(i)	1296	**1**	
2(d)(ii)	29	**1**	
2(d)(iii)	14	**1**	
2(d)(iv)	0.008 or $\frac{1}{125}$	**1**	
3(a)	2, 6	**2**	**B1** mark for each
3(b)(i)	Triangle at (–3, 1) (–5, 3) (–3, 3)	**2**	**B1** for reflection in $x = k$ or $y = -1$
3(b)(ii)	Triangle at (2, 2) (2, 6) (6, 6)	**2**	**B1** for correct size and orientation, incorrect centre
3(b)(iii)	Translation	**1**	
	$\begin{pmatrix}-5\\3\end{pmatrix}$	**1**	
4(a)(i)	6 pens and 1.3[0]	**3**	**M1** for $\frac{10}{1.45}$ **M1** for $k \times 1.45$ where k is an integer
4(a)(ii)	4.76	**2**	**M1** for $5.60 \times (1-\frac{15}{100})$ oe
4(b)	22	**2**	**M1** for ordered list of first 6 or last 6 or **B1** for 19 and 25 both identified
4(c)	3000 1500 2500	**3**	**M2** for $\frac{7000}{6+3+5} \times k$ or better, where k is 6 or 3 or 5 or **M1** for $\frac{7000}{6+3+5}$ or better implied by 500 If no working **M2** implied by one correct answer in correct place If zero scored, **M1** for all correct answers in wrong order
4(d)	909.09 or 909.1[0] or 909.0 or 909	**2**	**M1** for $\frac{1400}{1.54}$
4(e)	2160.09 or 2160.1[0] or 2160.0 or 2160	**3**	**M2** for $2000\ (1+\frac{2.6}{100})^3$ oe or **M1** for $2000\ (1+\frac{2.6}{100})^2$ soi by 2105.35

Question	Answer	Marks	Partial Marks
5(a)	$\frac{90}{360} \times 900$ [= 225]	**1**	
5(b)	45	**2**	**M1** for $\frac{18}{360} \times 900$ oe
5(c)	Correct pie chart	**2**	**B1** for 56° or 50° soi
5(d)(i)	0	**1**	
5(d)(ii)	$\frac{1}{20}$ cao	**2**	**M1** for $\frac{18}{360}$ or $\frac{\textit{their}\textbf{(b)}}{900}$ oe
5(e)	350	**2**	**M1** for $\frac{125}{900} \times 2520$ or $\frac{50}{360} \times 2520$ oe
6(a)(i)	95	**2**	**B1** for 9.5
6(a)(ii)	135	**1**	
6(b)(i)	Correct length and bearing	**2**	**B1** for 7.8 cm from *A* **B1** for 103° from *A*
6(b)(ii)	104	**2**	**M1** for $\frac{78}{45} \times 60$ oe or for $\frac{78}{\text{time}}$
6(c)	Correct region shaded with correct arcs	**5**	**B2** for correct bisector with correct arcs or **B1** for short bisector with correct/incorrect/no arcs or for correct arcs but no line **B2** for arc 7 cm centre *A* or **B1** for short arc 7 cm from centre *A*
7(a)(i)	Pentagon	**1**	
7(a)(ii)	Parallelogram	**1**	
7(a)(iii)	Obtuse	**1**	
7(b)(i)	2400	**2**	**M1** for $25 \times 12 \times 8$
7(b)(ii)	[0] .0024	**1FT**	

Question	Answer	Marks	Partial Marks
7(c)(i)	Radius	**1**	
7(c)(ii)	Angle [in a] semicircle, [90°]	**1**	
7(c)(iii)	50.3 or 50.26 to 50.27…….	**2**	**M1** for $2 \times 8 \times \pi$ or $16 \times \pi$
7(c)(iv)	11.5 or 11.48 to 11.49	**3**	**M2** for $\sqrt{14^2 - 8^2}$ soi or better or **M1** for $14^2 = 8^2 + CD^2$ or better
8(a)(i)	$12p - 7r$ final answer	**2**	**B1** for $12p + jr$ or $kp - 7r$ j, k can be 0 or $12p + -7r$
8(a)(ii)	$24x^5$ final answer	**1**	
8(b)	$90x + 75y$ final answer	**2**	**B1** for $90x + jy$ or $kx + 75y$ j, k can be 0 or $0.9x + 0.75y$
8(c)	$4p(3p - 2)$ final answer	**2**	**B1** for $4(3p^2 - 2p)$ or $p(12p - 8)$ or $2(6p^2 - 4p)$ or $2p(6p - 4)$
8(d)	5	**3**	**M1** for first correct step **M1FT** for second correct step
8(e)	Correctly equating one set of coefficients	**M1**	
	Correct method to eliminate one variable	**M1**	Dependent on the coefficients being the same for one of the variables. Correct consistent use of addition or subtraction using their equations.
	[x =] 2.5	**A1**	
	[y =] 11	**A1**	If zero scored, **SC1** if no working shown, but 2 correct answers given or **SC1** for 2 values satisfying one of the original equations
9(a)(i)	−6, 6, 14	**3**	**B1** for each
9(a)(ii)	Correct curve	**4**	**B3FT** for 6 or 7 points correctly plotted or **B2FT** for 4 or 5 points correctly plotted or **B1FT** for 2 or 3 points correctly plotted
9(b)(i)	Correct ruled line	**1**	
9(b)(ii)	$1.8 \leqslant x < 2.0$, 5	**1FT**	**FT** intersection of *their* curve with the line $y = 5$