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MATHEMATICS **0580/32**

Paper 32 (Core) **March 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	Part marks
1 (a) (i)	36	**1**	
(ii)	3 000 330 cao	**1**	
(iii)	125	**1**	
(iv)	1, 2, 4, 8, 16	**2**	**M1** for 3 or 4 correct factors and no extras or for 5 correct factors and one extra
(v)	Any multiple of 24	**1**	
(vi)	23 or 29	**1**	
(b) (i)	570 cao	**1**	
(ii)	567.49 cao	**1**	
(c) (i)	7	**1**	
(ii)	–3	**1**	
(iii)	[0].01 oe	**1**	
2 (a)	reflection	**1**	
	y-axis oe	**1**	
(b) (i)	correct reflection at (2, −1), (4, −1), (4, −5), (3, −5), (3, −2), (2, −2)	**2**	**SC1** reflection in $y = k$
(ii)	rotation	**1**	
	[centre] (0, 0) oe	**1**	
	180°	**1**	
(c) (i)	correct enlargement at (−8, 5), (−5, 5), (−5, −4), (−2, −4), (−2, −7), (−8, −7)	**2**	**SC1** for enlargement sf 3 in wrong position or for enlargement sf k using correct centre
(ii)	9	**2**	**M1** for 3×3 or 3^2 or 45 seen If zero scored **SC1** for (correct area of their enlargement) ÷ 5

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Question	Answer	Marks	Part marks
3 (a) (i)	$\frac{20}{5}\times(5+3)$ or $\frac{20}{5}\times 8$	**M2**	**M1** for $\frac{20}{5}$
(ii)	11 : 7	**4**	**B2** for [girls=]24 and [boys=]16 or **B1** for 24 or 16 or **M1** for $\frac{40}{5}$ **B1FT** for 44:28 or *their*24+ 20: *their*16+ *their* (32–20) Only FT provided total is 72 before simplifying
(b)	430.5[0]	**3**	**M2** for 72 × 5.75 + 2 × 8.25 oe or **M1** for 72 × 5.75 or 2 × 8.25
(c)	1625 or 4.25pm	**2**	**M1** for $45\times 3+2\times 20$
(d)	12.5	**3**	**M2** for $\frac{3.6-3.2}{3.2}\times[100]$ oe or **M1** for 3.6 − 3.2 or $\frac{3.6}{3.2}$ [×100] or better
(e) (i)	$\frac{17}{18}$ oe	**1**	
(ii)	4	**1**	
4 (a)	90, 180	**1**	
(b)	parallelogram	**1**	
	rhombus	**1**	
	kite	**1**	
(c)	56 vertically opposite [to 56°]	**1,1**	
	56 corresponding [to 56°]	**1,1**	
	73 alternate [to 73°]	**1,1**	
(d) (i)	113	**1**	
(ii)	7.5 km	**1**	
(iii)	*H* correct	**2**	**B1** for correct angle or correct distance

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Question	Answer	Marks	Part marks
5 (a) (i)	15	**1**	
(ii)	$\frac{1}{4}$ oe	**1FT**	**FT** *their* **(a)(i)** / 60
(b)	72	**1FT**	**FT** 18 / their **(a)(ii)** or 18 / their **(a)(i)** × 60
(c)	34	**2**	**M1** for $[85]\times\frac{24}{60}$ or $85\times 24[\div 60]$ or $85\div 60\times[24]$
(d)	52	**1FT**	**FT** is 18 + *their* 34
(e)	ruled line from (10 30, 0) to (10 45, 18)	**1**	
	ruled line from (10 45, 18) to (10 50, 18)	**1**	
	ruled line from (10 50, 18) to (11 14, 52)	**1FT**	**FT** (10 50, 18) to (11 14, *their* 52)
6 (a) (i)	$\frac{6}{11}$ oe	**1**	
(ii)	4	**2**	**M1** for 10 black marbles or $\frac{1}{3}$ is 5 marbles
(b) (i)	155	**1**	
(ii)	$3w+10b=290$ oe	**1**	
(iii)	[*w*] 20 [*b*] 23	**3**	**M1FT** for correct method to eliminate one variable **A1** for $w = 20$ **A1** for $b = 23$ If zero scored, **SC1** for either: 2 correct answers given or 2 values satisfying one of their original equations
(c)	32.5 , 37.5	**1,1**	**SC1** for both answers correct but reversed
(d)	correct net	**2**	**M1** for 5 correctly placed 3 cm by 3 cm squares and one incorrect or missing

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Question	Answer	Marks	Part marks
7 (a)	I, J correctly plotted	**1**	
(b)	positive	**1**	
(c) (i)	ruled line of best fit	**1**	
(ii)	16 to 19	**1**	
(d) (i)	D, H, I	**2**	**M1** for 2 correct and no extras or for 3 correct and 1 extra
(ii)	156	**1**	
(iii)	55.6 or 55.60 to 55.61	**2**	**M1** for $34^2 + 44^2$ or better
(e)	1020	**2**	**M1** for $\frac{(16+44)}{2} \times 34$ oe
8 (a) (i)	correct angle bisector drawn with 2 pairs of arcs	**2**	**B1** for correct bisector drawn without arcs or for two pairs of correct arcs
(ii)	correct shading	**1FT**	
(b) (i)	correct perpendicular bisector drawn with 2 pairs of arcs	**2**	**B1** for correct bisector drawn without arcs or for two pairs of correct arcs
(ii)	correct shading	**1FT**	
(iii)	337°	**1**	
(c)	correct arcs drawn and correct region shaded inside circle	**3**	**B1** 5 cm arc drawn centre *M* **B1** 4 cm arc drawn centre *N* If zero scored, **SC1** for arcs drawn wrong way round
9 (a)	–2, –4, 8, 4	**2**	**B1** for any 2 correct
(b)	completely correct curve	**4**	**B3FT** for 9 or 10 correct plots **B2FT** for 7 or 8 correct plots **B1FT** for 5 or 6 correct plots
(c)	$y = x$, $y = -x$ oe	**1,1**	
(d)	point at (2.8, 2.8) or (–2.8,–2.8)	**1FT**	**FT** a point on their curve lying on $y = x$

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