

**MARK SCHEME for the May/June 2010 question paper**  
**for the guidance of teachers**

**0580 MATHEMATICS**

**0580/32**

Paper 32 (Core), maximum raw mark 104

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

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### Abbreviations

cao	correct answer only
cso	correct solution only
dep	dependent
ft	follow through after error
isw	ignore subsequent working
oe	or equivalent
SC	Special Case
www	without wrong working
art	anything rounding to
soi	seen or implied

Qu.	Answers	Mark	Part Marks
<b>1 (a) (i)</b>	3, 4, 6, 9, 12, 18	2	W1 for 4 or 5 correct and no errors or 6 correct and 1 error.
<b>(ii)</b>	Any two of 3, 6, 9, 18	2	W1 for 1 correct and no errors or 2 correct and one extra, incorrect given.
<b>(b)</b>	25, 36, 49	3	–1 each error or omission SC2 for all of $5^2$ , $6^2$ , $7^2$ . SC1 for all of 5, 6, 7
<b>(c)</b>	$p = 2, q = 7$	2	W1 for either correct.
<b>2 (a)</b>	12	3	Either M1 for $150 - 132$ soi M1 for $'18' \div 150 \times 100$ or M1 for $132/150 \times 100$ M1 for $100 - '88'$
<b>(b)</b>	60	3	M1 for $15 + 7 + 11$ M1dep for $15 \div '33' \times 132$ , $132 \div '33' \times 15$ , $4 \times 15$ SC2 for 60:28:44
<b>(c)</b>	$\frac{2}{11}$ cao	2	W1 for $\frac{12}{66}$ or $\frac{8}{44}$ or $\frac{6}{33}$ or $\frac{4}{22}$
<b>(d)</b>	(\$)162	2	M1 for $108 \div 100 \times 150$ or $150 + (8 \div 100 \times 150)$

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3 (a)	32	2	M1 for $8 \div \frac{1}{4}$ or $8 \times 4$
(b) (i)	14 15	1	
(ii)	20	2	M1 for $12 \div 36$ or $(12 \div 36) \times k$
(iii)	Horizontal line from 13 45 to '14 15' Line from ('14 15', 8) to ('14 35', 20)	1ft 1ft	
(c) (i)	1(h) 20(min)	2	M1 for $20 \div 15$ Implied by 1.33(3333) seen or 1 (hr) 33 (mins) or $1 \frac{1}{3}$
(ii)	Line from 13 30 to '14 50'	1ft	
(iii)	15	1ft	
4 (a)	1 <sup>st</sup> row 7, 8, 6, 7, 5, 4 2 <sup>nd</sup> row 0, 8, 12, 21, 20, 20	1 1ft	Allow 1 error Allow 1 error
(b) (i)	103	1ft	
(ii)	2.575 or 2.58	2	M1 Their (b)(i) $\div 40$
(iii)	2 cao	2	M1 clear attempt to find the middle number of goals.
(iv)	1 cao	1	
(c) (i)	5	1	
(ii)	Line on pie chart $108^\circ$ from either given line <u>and</u> correctly labelled.	2	M1 for $(12 \text{ or '5'}) \div 40 \times 360$ oe seen
(d) (i)	$\frac{23}{40}$	1	or 0.575 or 57.5%
(ii)	$\frac{35}{40}$ or $\frac{7}{8}$	1ft	or 0.875 or 87.5%, or $\frac{315}{360}$ ft 1 – their (c)(i)/40 oe

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5 (a) (i)	art 6.43	2	M1 for $10\sin(180 - 140)$ or $10\sin 40$ or 1
(ii)	77.1 to 77.2	1ft	Their (a)(i) $\times 12$
(b)	8.5	3	W1 for $x + 2 + x + x + 2 + x = 38$ oe M1 for correct first step but must be from a linear equation $ax + b = k$
6 (a) (i)	45	1	
(ii)	8 cao	2	M1 for either $360 \div 45$ or $360 \div$ their (a)(i)
(iii)	(Regular) Octagon	1ft	Only ft for integer in (a)(ii)
(b)	(x =) 90 (y =) 26 cao (z =) 116 cao	1 2 2	M1 for $90 - 64$ M1 for $180 - 64$ or M1 for $90 + 'y'$ seen with correct working
7 (a)	Point $F$ constructed with arcs. $AF = 4$ cm $EF = 5$ cm	2	1 mark if correct without arcs SC1 if $F$ correctly constructed but in pond
(b)	Bisector of $CD$ 4.5 cm, with correct arcs	2	1 mark if correct without arcs
(c)	Bisector of angle $BCD$ with 4 correct arcs	2	1 mark if correct without arcs
(d) (i)	6.8 – 7.3	1ft	ft their LM
(ii)	136 – 146	1ft	ft their (d)(i) $\times 20$
(e)	$45 \times$ their (d)(ii) or $900 \times$ their (d)(i)	2dep	Dep on at least 1 or 2 in (b) M1 $0.5 \times 90 \times$ their (d)(ii) or $0.5 \times 4.5 \times$ their (d)(i) or SCM1 for clear attempt at $\frac{1}{2} \times \text{base} \times \text{height}$ of their triangle CML with consistent units
(f)	Arc of a circle inside the hexagon, radius 6 cm. Correct labelling	1 1ft	Must be bounded by their $LM$ , $MD$ , part of $DE$ and attempt at an arc

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8 (a)	$y$ values $-1, -2, -3, 3, 2, 1$	3	W2 4 or 5 correct W1 2 or 3 correct
(b)	12 points plotted Two smooth correct curves No part across $y$ axis	P2ft C1 B1	P1ft for 10 or 11 'correct'. Independent
(c)	2	1	
(d) (i)	$y = x$ ruled	1	At least 2 diagonal large (4×4) squares.
(ii)	(4 to 4.5, 4 to 4.5) (-4 to -4.5, -4 to -4.5)	2ft	1 mark for each point Ft from their intersections
(e)	$y = -x$ ruled	1ft	Follow through reflection of their (d)(i) in the $y$ axis.
9 (a) (i)	$3k + 4p - 7$ final answer	2	W1 for any 2 correct terms seen or correct answer seen but spoiled by subsequent working.
(ii)	$x - 2y^2$ final answer	2	W1 for a correct term seen or correct answer seen but spoiled by subsequent working.
(b) (i)	$12 + 21g$ final answer	1	
(ii)	$25m^3 - 5mt^2$ final answer	2	W1 for one correct term
10(a) (i)	9.43 art	2	M1 for $\sqrt{8^2 + 5^2}$ oe or $\sqrt{89}$
(ii)	32 or 32.0 art	2	M1 for $\tan(A) = 5 \div 8$ or better
(b) (i)	Similar	1	
(ii)	Enlargement (SF) 2 (Centre) A	1 1 1	W1 for each Independent Independent
(c)	9 and 11	2	W1 for 1 correct or diagram 5 two more than diagram 4.
(d) (i)	21	1	
(ii)	$2n + 1$ oe	2	W1 for $2n + j$ seen or $kn + 1$ seen where $k \neq 0$
(e)	23	2	M1 for $2n + 1 = 47$ seen or their (d)(ii) = 47 seen SC1 for embedded answer