

**MARK SCHEME for the May/June 2012 question paper**  
**for the guidance of teachers**

**0580 MATHEMATICS**

**0580/12**

Paper 1 (Core), maximum raw mark 56

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.

Mark schemes must be read in conjunction with the question papers and the report on the examination.

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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
soi	seen or implied

Qu	Answers	Mark	Part Marks
<b>1</b>	16	<b>1</b>	
<b>2</b>	$82\% < \frac{23}{28} < 0.83 < \frac{5}{6}$	<b>2</b>	<b>M1</b> for correct conversion of both fractions to decimals or percentages. Minimum 3 sf. <b>or B1</b> for correct but reverse order
<b>3</b>	Wednesday 22 15 or 10 15pm	<b>2</b>	<b>B1</b> <b>B1</b>
<b>4 (a)</b>	I cao	<b>1</b>	
<b>(b)</b>	I N cao	<b>1</b>	
<b>5 (a)</b>	1.9	<b>1</b>	
<b>(b)</b>	30.4	<b>1</b>	
<b>6</b>	$\begin{pmatrix} 13 \\ -2 \end{pmatrix}$	<b>2</b>	<b>B1</b> for one correct component
<b>7</b>	25 (correct working essential)	<b>2</b>	<b>M1</b> for $18 + 4 + 3$ with denominator 12 must be soi (oe is possible)
<b>8</b>	64 000 or $6.4 \times 10^4$	<b>2</b>	<b>SC1</b> for 63800 or $6.38 \times 10^4$ <b>or</b> figs 64 or $6.4 \times 10^k$ in answer space.
<b>9 (a)</b>	$a^5$	<b>1</b>	
<b>(b)</b>	0.04 or $\frac{1}{25}$	<b>1</b>	
<b>10</b>	$12\,550 \varnothing n < 12\,650$	<b>2</b>	<b>B1</b> for one correct or both correct but reversed.
<b>11 (a)</b>	109 681 final answer	<b>1</b>	
<b>(b)</b>	$1.09681 \times 10^5$	<b>1ft</b>	Their part <b>(a)</b> in standard form
<b>12</b>	4.46 or 4.456 to 4.459 cao	<b>3</b>	<b>B1</b> for 28 seen <b>M1ft</b> for $\frac{\textit{their}28}{2\pi}$ oe or better.

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13	(a)	$y(x - y)$ or $y(-y + x)$	1	
	(b)	$[x =] 4.75$ oe	2	<b>M1</b> for $4x = 12 + 7$ or $x - \frac{7}{4} = \frac{12}{4}$ or better
14	(a)	Positive	1	
	(b)	Zero oe	1	
	(c)	Negative	1	
15	(a)	Kite	1	
	(b)	$14 \text{ cm}^2$	1, 1	Independent marks
16	(a)	126	2	<b>M1</b> for $7 \div (8 + 3 + 7 + 2) \times 360$ or for $54 \div 3 \times 7$ or $144 \div 8 \times 7$
	(b)	Line dividing sector into $126^\circ$ and $36^\circ$	1ft	Ft their angle for blue sector.
17		$[x =] 2$ $[y =] 5$	3	<b>M1</b> for consistent multiply and add/subtract as appropriate. Allow computational errors. Other methods allowed. <b>A1</b> for correct $x$ or $y$ .
18	(a)	15	2	<b>M1</b> for $\frac{9-3}{0.4}$ oe
	(b)	$11.7(0)$	2	<b>M1</b> for $9 \times 1.3$ oe
19	(a)	$[x =] 32$	2	<b>M1</b> for angle $OCD = 90^\circ$ soi (or angle $OCB = 90^\circ$ )
	(b)	$[y =] 58$	2ft	<b>M1</b> for angle $AEC = 90^\circ$ soi Follow through 90 – their (a)
20	(a)	Pythagoras method $30^2 + 16^2 [= 34^2]$ or $900 + 256 [= 1156]$  $34^2 = 1156$ or $\sqrt{1156} = 34$	<b>M1</b>  <b>E1dep</b>	
		Trig method $\tan A = \frac{30}{16}$ and $\sin C = \frac{16}{34}$ oe  Angles 61.9 and 28.1 and statement to show that angle $B = 90^\circ$	<b>M1</b>  <b>E1dep</b>	The two trig ratios used must involve all 3 sides of the triangle.
	(b)	61.9 or 61.92 to 61.93	2	<b>M1</b> for $\tan [CAB =] \frac{30}{16}$ or $\sin [CAB =] \frac{30}{34}$ or $\cos [CAB =] \frac{16}{34}$ (or better)

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<b>21 (a)</b>	<u>Exterior angle method</u> [Ext angle =] $360 \div 5$ $5 \times (180 - 72) = 540$	<b>M1</b> <b>E1dep</b>	
	<u>Formula method</u> $(n - 2) \times 180$ or $\frac{(n - 2) \times 180}{n}$ $(5 - 2) \times 180 = 540$ or $\frac{(5 - 2) \times 180}{5} = 108$ and $5 \times 108 = 540$	<b>M1</b>  <b>E1dep</b>	
	<u>Triangle methods</u> Explanation or sketch to split pentagon into 3 or 5 triangles. $3 \times 180 = 540$ or $5 \times 180 - 360 = 540$	<b>M1</b>  <b>E1dep</b>	
<b>(b)</b>	[x =] 104 [y =] 135	<b>3ft</b>	B1 [x =] 104 M1 for $540 - (90 + 76 + \text{their } x)$