

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

Cambridge International General Certificate of Secondary Education

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## **MARK SCHEME for the October/November 2014 series**

### **0581 MATHEMATICS**

**0581/22**

Paper 2 (Extended), maximum raw mark 70

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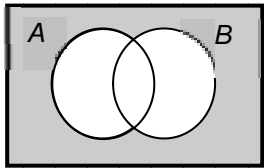
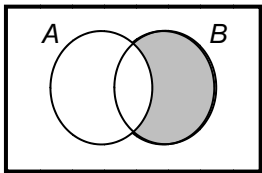
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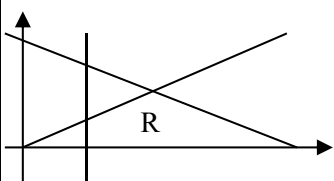
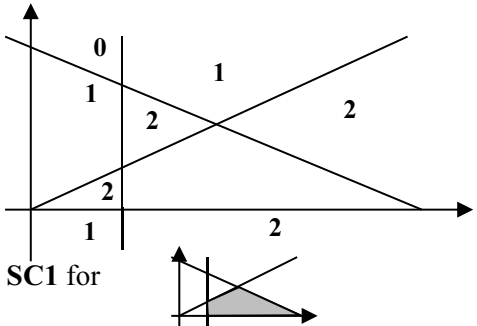
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**Abbreviations**

- 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

Qu.	Answers	Mark	Part Marks	
1	$6 + 5 \times (10 - 8) = 16$	1	One pair of brackets only	
2	20	1		
3	8	1		
4	$\xi$ 	1		
	$\xi$ 	1		
5	$v^3 - p$	2	M1 for $v^3 = p + r$	
6	95.5 96.5 in correct places cao	2	B1 for 95.5 or 96.5 in correct place or for answers reversed	
7	(a)	700	2	M1 for $2800 \times 0.325$
	(b)	0.28	1	
8	$\frac{7}{6}$ oe	B1	Or M1 for $\frac{56}{48} \div \frac{42}{48}$ or equivalent division with fractions with common denominator	
	their $\frac{7}{6} \times \frac{8}{7}$ oe			M1
	$\frac{4}{3}$ or $1\frac{1}{3}$ cao			A1
	must see working			

9	9.13 or 9.127 to 9.1271	3	<p>M2 for <math>\sqrt[3]{\frac{1000}{440}}</math> [1.31] oe</p> <p>or <math>\sqrt[3]{\frac{440}{1000}}</math> [0.761] oe</p> <p>Or M1 for <math>\frac{1000}{440}</math> [2.27] oe</p> <p>or <math>\frac{440}{1000}</math> [0.44] oe</p> <p>or <math>\sqrt[3]{\frac{\text{figs } 440}{\text{figs } 1000}}</math> or <math>\sqrt[3]{\frac{\text{figs } 1000}{\text{figs } 440}}</math></p>
10	97.2[0]	3	<p>M1 for <math>C = kr^2</math></p> <p>A1 for <math>k = 30</math></p> <p>or M2 for <math>\frac{202.8}{2.6^2} = \frac{c}{1.8^2}</math> oe</p>
11 (a)	$\begin{pmatrix} 6 & -4 \\ -8 & 38 \end{pmatrix}$	2	<p>M1 for a 2 by 2 matrix with two correct elements</p> <p>SC1 for <math>\begin{pmatrix} 16 &amp; -14 \\ -18 &amp; 28 \end{pmatrix}</math></p>
(b)	14	1	
12		3	<p></p> <p>SC1 for</p>
13	13.5 or 13.45[.]	3	<p>M2 for <math>\sqrt{\frac{2 \times 85}{\sin 110}}</math></p> <p>or M1 for <math>\frac{1}{2} \times a^2 \times \sin 110 = 85</math></p> <p>or <math>\frac{2 \times 85}{\sin 110}</math> oe [180.9..]</p>
14 (a)	2.47 or 2.474 to 2.4744	2	M1 for $\frac{56}{360} \times \pi \times 2.25^2$ oe
(b)	0.742 or 0.7422 to 0.74232	1FT	FT <i>their</i> (a) $\times 0.3[0]$ correctly evaluated.

15	(a)	$2 \times 3 \times 3 \times 5$	2	<b>B1</b> for 2, 3, [3] and 5 identified as prime factors  or <b>M1</b> for partial prime factorisation $6 \times 3 \times 5$ or $2 \times 9 \times 5$ or $3 \times 3 \times 10$ or $2 \times 3 \times 15$
	(b)	630	2	<b>M1</b> for $2 \times 3^2 \times 5 \times 7$ oe or for listing multiples of 90 and 105 at least up to 630
16	(a)	108  Angle at <b>centre</b> is <b>twice</b> angle at <b>circumference</b> oe	1  1	
	(b) (i)	$-\frac{4}{3}$ oe	1	
	(b) (ii)	-1	1	
17	[0.]08	4	<b>M3</b> for $200 \times \left(1 + \frac{2}{100}\right)^2 - 200 - \frac{200 \times 2 \times 2}{100}$ oe or <b>M1</b> for $200 \times \left(1 + \frac{2}{100}\right)^2$ <b>and M1</b> for $\frac{200 \times 2 \times 2}{100}$ [+200]	
18	(a)	56	2	<b>B1</b> for 16 soi or <b>M1</b> for 72 – <i>their</i> 16
	(b) (i)	63 or 63 to 63.5	1	
	(b) (ii)	22 or 21.6 to 23      nfw	2	<b>B1</b> for 49.8 to 50.2 seen or 71.8 to 72.8
19	(a) (i)	$c - a$	1	
	(a) (ii)	$-\frac{1}{3} a + \frac{1}{3} c$	3	<b>M2</b> for $-a + \frac{1}{3} (c + 2a)$ oe  e.g. $-a + c + 2a - \frac{2}{3} (c + 2a)$ Or <b>M1</b> for a correct route from A to X
	(b)	$\overrightarrow{AC}$ is a multiple of $\overrightarrow{AX}$ <b>and</b> they share a common point [A]	1  1	oe  oe

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20	(a)	102 to 106	2	<b>B1</b> for 5.1 to 5.3 seen
	(b)	Correct position of F with correct arcs for angle bisector	5	<b>B2</b> for Correct ruled angle bisector of $A$ and correct arcs or <b>B1</b> for correct bisector with no/wrong arcs <b>and</b> <b>B2</b> for Arc centre $C$ , radius 8 cm or <b>B1</b> for arc centre $C$ with incorrect radius or correct conversion to 8cm <b>and</b> <b>B1</b> for marking position of F on <i>their</i> bisector and 8cm from $C$ or on <i>their</i> arc centre $C$
21	(a)	$\frac{x+7}{(2x-1)(x+2)}$ Final answer	3	<b>B1</b> for $3(x+2) - 1(2x-1)$ seen or better  <b>B1</b> for denominator $(2x-1)(x+2)$ oe seen <b>SC2</b> for final answer $\frac{x+5}{(2x-1)(x+2)}$
	(b)	$\frac{2x}{x+7}$ Final answer	4	<b>M1</b> for $4x(x-4)$ or partial factorisation of numerator  and <b>M2</b> for $[2](x+7)(x-4)$ oe  or <b>M1</b> for $[2](x^2 + 3x - 28)$ or $[2](x+a)(x+b)$ where $ab = -28$ or $a + b = 3$  <b>SC3</b> for answer $\frac{4x}{2x+14}$ oe