

## International GCSE in Mathematics B - Paper 1 mark scheme

Question	Working	Answer	Mark	AO	Sub-total	Total
1	$\frac{22.5}{60} \times 100$		M1	1.1		
2	$\frac{25}{8} \times \frac{10}{41}$ or $3.125 \div 4.1$ <b>N.B.</b> No working scores M0 A0	37.5(%) $\frac{125}{164}$ (cao)	A1 M1 A1	1.1		2
3	$\frac{1}{2}x = 1 - 1.25$ or $2x = 4 \times 1 - 5$		M1	1.3		
4	$42 = 2 \times 3 \times 7$ $84 = 2 \times 2 \times 3 \times 7$ $154 = 2 \times 7 \times 11$ Prime factors of two of 42, 84 and 154 or $42 = 3 \times 14$ $84 = 6 \times 14$ $154 = 11 \times 14$ Two of above or Attempt at factor tree for two of the numbers	$-\frac{1}{2}$	A1	1.1		2
		HCF = 14	M1 A1			2

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5		-2, 1, 4	B2 (-1 eeo)	1.3		2
6(a)		1	B1	2.6	1	
6(b)		2	B1		1	2
7	$\overline{OC} = \begin{pmatrix} 3 \\ -4 \end{pmatrix} + \begin{pmatrix} -5 \\ 7 \end{pmatrix}$	$\begin{pmatrix} -2 \\ 3 \end{pmatrix}$	M1  A1	2.8		2
8	85 mm or 35 mm	240	M1 A1	1.1 2.7		2
9	$P(1, 1) + P(1, 2) = \frac{1}{6} + \frac{1}{6}$ (oe)	$\frac{2}{6}, \frac{1}{3}, 0.333, 33.3\%$	M1  A1	3.10		2
10	$x + 3 + 2\sqrt{3}x = y + 6\sqrt{2}$ $\sqrt{3}x = 3\sqrt{2}$	$x = 6, y = 9$	M1  M1 (DEP) A1	1.3		3
11(a)		$e$	B1	1.2	1	
11(b)		$i, j$	B1		1	
11(c)		$g, h, i, j$	B1		1	3

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12	$\left(\frac{2}{5}\right)^3$ or $\left(\frac{5}{2}\right)^3$ seen <b>N.B.</b> accept ratio or decimal form $\frac{500}{V} = \left(\frac{5}{2}\right)^3$ (oe) (or $\sqrt[3]{500}$ seen $\left(\frac{2}{5} \times \sqrt[3]{500}\right)^3$ (oe))	32 (cao)	B1  M1 (B1) (M1) A1	2.6		3
13			M1	1.4		
(a)	$y = \frac{x-4}{3}$	$(m =) \frac{1}{3}$	A1		2	
(b)	<b>N.B.</b> The M marks is awarded once only	$-\frac{4}{3}$	A1		1	3
14(a)		0.24, $\frac{6}{25}$ , 24%	B1 M1 A1	3.10	1	
14(b)	$0.76 \times 600$	456			2	3

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15	$\frac{y-4}{x-1} = \frac{-5-4}{-2-1} \quad (\text{oe})$ $y-4 = (3)(x-1)$ (oe, removing denominators)		M1 M1 DEP	1.4		3
16(a)		$y = 3x + 1$ $\begin{pmatrix} 24 & -10 \\ 13 & 11 \end{pmatrix}$	B2 (-10000)	1.5	2	
16(b)		$\begin{pmatrix} -9 & 7 \\ -10 & 0 \end{pmatrix}$	B2 (-10000)		2	4
17	$\left( \begin{array}{l} \because \angle EDG = \angle ADC = 90^\circ \\ \text{and } \therefore \angle ADG \text{ is common} \\ \angle EDA = \angle CDG \end{array} \right)$ $\therefore \Delta^s \begin{array}{l} EDA \\ GDC \end{array} \text{ are congruent}$ (SAS) Hence $AE = CG$	(cc)	B1 B1 B1 B1	2.6		4
	Two reasons (those in brackets above)					

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18	<p>Rearranging st coefficient of <math>x</math> or <math>y</math> is the same in both equations or isolating <math>x</math> or <math>y</math></p> <p>Subtract or adding equations or substituting expression for <math>x</math> or <math>y</math> to obtain <math>y</math> or <math>x</math></p> <p><b>N.B.</b> Allow a total of 1 slip in both M marks.</p>	$x = 3$ $y = 4$	M1  M1 DEP  A1 A1	1.3		4
19	$52 = k\sqrt{169}$ (oe) $x = \left(\frac{68}{"4"}\right)^2$ (or $52 = k\sqrt{169}$ and $68 = k\sqrt{x}$ $\frac{\sqrt{x}}{\sqrt{169}} = \frac{\sqrt{x}}{13} = \frac{68}{52}$ (oe)) <b>N.B.</b> Just seeing above line without sight of the first line earns both M marks	$k = 4$ (oe, can be implied)	M1 A1  M1 DEP  (M1) (M1 DEP)  (A1) A1	1.4		4
		$\left(\sqrt{x} = \frac{68}{4} \text{ (oe)}\right)$ $x = 289$ (cao)				

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20(a)	$\angle CAD = 90^\circ$ , $\angle ACD = 28^\circ$	62	B1, B1 B1	2.6	3	
20(b)		118	B1 ft		1	4
21(a)		$x = n - 4, y = n - 2$	B1	1.3	1	
21(b)	$3n - 6$	(cc)	M1 A1	1.1	2	
21(c)	$n$ even $\therefore 3n - 6$ is divisible by 6					
22(a)		10, 12, 14 (oe)	B1		1	4
22(b)	$\frac{75}{360} \times r^2 \times \pi = 200$		M1	2.7		
	$\frac{75}{360} \times 2 \times \pi \times 17.5'$	17.5 (17.48077...)	A1	1.3	2	
	$+ 2 \times 17.5'$		M1	2.7		
		57.9 (57.84678...)	M1 DEP A1		3	5

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23(a)		4	B1	3.10	1	
23(b)	Rearranging the number of minutes in order	5	M1		2	
23(c)	$\frac{6+4+11+9+4+4+5+6+5+4}{9}$ $\left( = \frac{54}{9} \right)$	6	M1 A1		2	5
24(a)	$(r+6)^2 = r^2 + 72$ or $r = \sqrt{(r+6)^2 - (\sqrt{72})^2}$ or $6 \times (6 + 2r) = 72$ (oe)		B1	2.6	1	
24(b)	$r^2 + 12r + 36 = r^2 + 72$ (oe) or $36 + 12r = 72$		M1 A1	1.3 1.3	2	
24(c)	$\sin \angle OPC = \frac{r}{r+6}$	$\angle OPC = 90^\circ$	M1 A1	2.9 2.9	2	5

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<b>25(a)</b>	$90 + 28t - 3t^2$ (2 terms correct)	(cao)	M1 A1	1.4 1.4	2	
<b>25(b)</b>	$'90 + 28t - 3t^2 = 0$ (oe) $\frac{+28 \pm \sqrt{(-28)^2 - 4 \times (3) \times (-90)}}{2 \times 3}$ (Solving 3 term quadratic) $\sqrt{1864}, 43.17$		M1  M1 DEP	1.4  1.3		
<b>26(a)</b>	$2 \times (-1.5)^3 - 3 \times (-1.5)^2 - 17 \times (-1.5) - 12$ (substitute)	awrt 11.9	M1	1.3	4	<b>6</b>
<b>26(b)</b>	$x^2 - 3x$ $(x-4)(x+1)$ (solving trinomial quadratic)	$= 0$ $x^2 - 3x - 4$ $(2x+3)(x-4)(x+1)$	A1  M1 A1  M1 INDEP A1		2  4	<b>6</b>



Question	Working	Answer	Mark	AO	Sub-total	Total
27(a)	Rewriting (or solving) $x^2 - x - 6 < 0$ as $(x - 3)(x + 2)$ (solving trinomial quadratic marking rules)	$x = 3$ and $x = -2$	M1  A1	1.3		
27(b)	Open circles at ' $x = -2$ and $x = 3$ ' Line joining ' $x = -2$ and $x = 3$ '	$x < 3$ $x > -2$ (or $-2 < x < 3$ )	A1ft A1ft (A2 ft)  B1 ft B1 ft		4    2	6
28(a)	<b>Penalise ncc ONCE only in question</b> $\frac{5}{\sin 30} = \frac{CD}{\sin 140}$ $CD = \frac{5 \times \sin 140}{\sin 30}$		M1  M1 DEP	2.9		
28(b)	$\frac{AC}{6.428} = \tan 30$ ( $AC = 3.711$ ) $\angle BCA = 80^\circ$ $\triangle ABC = \frac{1}{2} \times AC \times 5 \times \sin 80^\circ$	6.43	A1  M1 M1  M1 DEP A1	2.9 2.6  2.7	3   4	7

