



ASSESSMENT and
QUALIFICATIONS
ALLIANCE

Mark scheme

June 2003

GCSE

Mathematics B

3302 Module 5

Paper 2 Intermediate

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1	27	B1	– 1 for each extra offered
	125	B1	
2	Line of 10 cm (or 8 cm or 6 cm) drawn	B1	± 2 mm
	Arcs for remaining lengths intersecting	M1	± 2 mm
	Fully accurate triangle	A1	SC1 for fully accurate 3,4,5 triangle
3(a)	$8z = 16$	M1	Or $8z = 11 + 5$
	2	A1	Note: $8 \times 2 - 5 = 11$ scores M1 A1
(b)	$3w - 6 = 9$	M1	Or $w - 2 = \frac{9}{3}$
	$3w = 15$	M1 dep	Or $w - 2 = 3$
	5	A1	$3 \times (5 - 2) = 9$ M2 A1 $3 \times 5 - 6 = 9$ M2 A1 $3 \times 5 - 2 = 9$ M1 M0 A0 $3w - 2 = 9, 3w = 11, w = \frac{11}{3}$ oe SC1
4(a)	7.1×3.6	M1	Accept 7×4
	25.56	A1	
	25.6	A1 ft	Note: for ft answer must come from a 2 dp answer shown 21.6 on its own scores M1A0A0 25.5 on its own scores M1A0A0
(b)	Valid explanation	B1	Accept: same base/length and same height/width or same formula/equation/calculation or length 7.1, width/height 3.6 or translation of right angled triangle to make rectangle (may be indicated on diagram) Do not accept: same dimensions/lengths/sides/measurements
(c)	4.9×11.5	M1	Accept 56.3
	56.35 or 56.4	A1	Note: $56.35 \Rightarrow 56.3$ scores M1 A1
5(a)	3, 2, 0	B2	– 1 each error or omission
(b)	Correct line drawn with a ruler	B1	± 1 mm Must go from $x = 0$ to $x = 4$
(c)	(2.5, 1.5)	B1	

6	180 – 137	M1	oe																
	43	A1	Further working such as 90 – 43 = 47 invalidates both marks																
7(a)	$2 \times \pi \times 0.3$	M1	oe																
	1.88 (4...)	A1	Accept 1.9																
(b)	100 ÷ their (a)	M1																	
	52.6 to 53.2 inclusive	A1	No ft from (a) here																
8(a)	$n - 9, n + 1, n + 11$ (in correct boxes)	B2	oe B1 for one of these correct																
(b)	Their entries added (+ n)	M1	Must include at least one entry which has “ $n \pm ..$ ”																
	$4n + 3$	A1																	
(c)	Their $(4n + 3) = 93$	M1 dep	Dependent on M1 from (b)																
	n not a whole number	A1 ft	oe ft provided ‘ n is not a whole number’ is stated Alternative: $T_{22} = 91$ and $T_{23} = 95$ seen M1 no T_n between these A1																
9	180 – 63	M1	Or $63 + 2x + x = 180$																
	(their) $117 \div 3$	M1	Or $3x = 117$																
	39	A1	Note: $(360 - 63) \div 3$ scores M0 M1 A0																
10	Trial between 2 and 3 correctly evaluated to the nearest whole number	B1	Working must be seen All trials must be correctly evaluated and either rounded or truncated and given to at least 1 dp																
	Trials between 2.3 and 2.4 inclusive that bracket the answer	B1	<table><tr><td>2.3</td><td>28.267</td><td>2.7</td><td>38.583</td></tr><tr><td>2.4</td><td>30.624</td><td>2.8</td><td>41.552</td></tr><tr><td>2.5</td><td>33.125</td><td>2.9</td><td>44.689</td></tr><tr><td>2.6</td><td>35.776</td><td></td><td></td></tr></table>	2.3	28.267	2.7	38.583	2.4	30.624	2.8	41.552	2.5	33.125	2.9	44.689	2.6	35.776		
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Trial at 2.35 or 2.36 or 2.37 and 2.4 stated as answer	B1	<table><tr><td>2.35</td><td>29.427875</td></tr><tr><td>2.36</td><td>29.664256</td></tr><tr><td>2.37</td><td>29.902053</td></tr></table> Marks for possible misreads $x^3 + 7$ and answer 2.8 B1 $x^2 + 7x$ and answer 3 B0 $x^3 - 7x$ (no answer between 2 and 3) B0	2.35	29.427875	2.36	29.664256	2.37	29.902053											
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11	$3^2 + 1.2^2$ (= 10.44)	M1	Must add two squares
	$\sqrt{\text{their } 10.44}$	M1 dep	Dependent on first M1
	3.2 or 3.23...	A1	Note: 3.2 scores A0 Answer = 3 with no working scores M0
12	$\pi \times 9^2$	M1	Or 254 (. ...) seen
	$\pi \times 5^2$	M1	Or 78 (. ...) or 79 seen
	Subtracting	M1 dep	Dependent on both previous M1s
	176 (or 56π)	A1	Accept 175.8 to 176 Using 18^2 and $10^2 \Rightarrow 703.2$ to 704 SC2
	cm^2	B1	Note: units mark
13	$2x + 10$ seen	B1	
	$6x$ and/or -3 seen	M1	Or $-6x$ or 3
	$x = -\frac{1}{2}$	A1	Do not accept $-3/6$
14(a)	r^4 should be r^3	B1	oe eg should be 3 dimensions r^4 is too many r^4 is wrong Note: an incorrect statement given nullifies a correct one in (a) and (b)
(b)	$2q$ is not 2-dimensional	B1	oe eg $2q$ is wrong $2q$ should be q^2
15(a)	$1 \leq n < 6$	M1	oe
	1 2 3 4 5	A2	A1 for 4 correct or if 6 included – 1 for each extra number
(b)	i) $y = \frac{1}{2}x$	B1	oe
	ii) $y \geq 0$	B1	Accept $y > 0$ or $0 \leq y \leq 3$
	$x \leq 6$	B1	Accept $x < 6$ or $0 \leq x \leq 6$
	$y \leq \frac{1}{2}x$	B1 ft	ft their (b)(i) Accept $y < \frac{1}{2}x$ or $x \geq 2y$ oe SC1 all 3 boundaries given as equations SC2 all 3 boundaries given as inequalities the wrong way round

16	$\frac{SQ}{14} = \cos 25^\circ$	M1	
	$SQ = 14 \times \cos 25^\circ (= 12.68\dots)$	M1	
	$\frac{\text{their } SQ}{8.6} = \tan R$	M1	Award this M1 only if SQ has been found by an attempt at trigonometry
	1.475... or 1.48	A1 ft	ft their SQ
	55.87 or 55.9 or 56	A1	
17(a)	$3x(x - 2y)$	B2	B1 for $3x(x\dots)$ or $3(x^2 - 2xy)$ or $x(3x - 6y)$ or $3x(\dots - 2y)$
(b)	$(y \pm a)(y \pm b)$ where $ab = 14$	M1	a and b must be integers
	$(y - 7)(y - 2)$	A1	Ignore solution of equation following correct brackets
18	Scale factor $\frac{9}{6}$ or $\frac{6}{9}$ or $\frac{6}{4}$ or $\frac{4}{6}$	M1	oe
	$AB = (\text{their } 1.5) \times 4$	M1	Or $9 \div (\text{their } 1.5)$
	$DB = 2$	A1	Alternative: $\frac{4}{4+x} = \frac{6}{9}$ or $\frac{4+x}{4} = \frac{9}{6}$ M1 $36 = 24 + 6x$ M1 $x = 2$ A1