

Mathematics B (MEI)

General Certificate of Secondary Education **B293**

Paper 3 Higher Tier

Mark Scheme for June 2010

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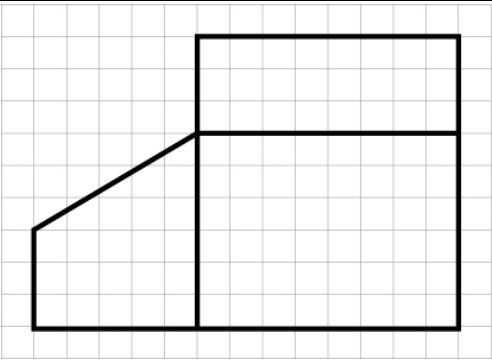
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SECTION A

If answers clearly come from incorrect working, do not award the marks.

		Response		Part marks
1		260	3	M1 Sub $d = 7, n = 2$ A1 sight of 30×7 or 42×5
2		Exact age of 20, etc in both groups eg 0 – 19, 20 – 39, etc	1 1	
3			3	B1 for each quadrilateral
4	(a)	$\frac{200 \times 40}{80} \quad \text{or} \quad \frac{210 \times 40}{80}$ $100 \quad \text{or} \quad 105$	M1 A1	for approximating at least 2 to 1sf
	(b)(i)	3216.3	1	
	(ii)	4.53	1	

		Response		Part marks
5	(a)	Any correct multiple of 3	1	
	(b)	Any correct value for n	1	
6	(a)	750	2	M1 for $300 \times \frac{125}{50}$ Or: 150 \equiv 25 seen, plus addition
	(b)	300, 225, 225	3	B2 for 2 correct Or M1 divide <i>their (a)</i> by 10 + M1 multiply by 4 or 3
7		B It has length to the power of 3. soi	1 1	
8	(a)	$2\frac{1}{3}, \frac{7}{3}$, or 2.33(3...)	3	B1 $5x - 2x = 4 + 3$ oe M1 divide by <i>their coeff of x</i>
	(b)	$4\frac{1}{2}, \frac{9}{2}$ or 4.5	3	B1 for $2x + 14$ B1 collect their terms correctly
	(c)	$1\frac{2}{3}, \frac{5}{3}$ or 1.66(6...) or 1.67	3	B1 $8 - 4x$ or $\frac{3}{4} - \frac{x}{4}$ B1 collect their terms correctly
9	(a)	$2 \pm \sqrt{5}$	3	M1 Correct sub in formula (allow one sign error) or $(x - 2)^2$ A1 $\sqrt{20}$ or $\sqrt{5}$ seen
	(b)	$\frac{x}{x+5}$ WWW	3	M1 attempt to factorise top and bottom A1 $x(x - 5)$ or $(x - 5)(x + 5)$

Section B

If answers clearly come from incorrect working, do not award the marks.

		Response	Part marks	
10	(a)		2	B1 for one error in plotting
	(b)(i)	Line added as above	1	
	(ii)	Correct line gives 66 - 69	1 ft	Strict ft Reading off at 5 km time = 33
	(c)	Positive	1	
11	(a)	21	2	M1 for product implying area
	(b)	Anything that rounds to 2.45	4	M1 for $\pi \times 0.7^2$ or $\pi \times 1.4^2$ Dep M1 for dividing by 2 M1 for 1.2×1.4 soi Or: SC3 for 2.4WWW
	(c)	10% of <i>their</i> (a) worked out + correct comparison	1 1ft	

		Response		Part marks
12		3, 4, 5	2	B1 $4 < 2n < 11$ oe
13	(a)	Angles at B and D are right angles Angles ACB and ECD are vertically opposite oe So triangles are similar	1 1 1	
	(b)	9	2	M1 for $\frac{3}{4} = \frac{AB}{12}$ oe
14		$x = 5, y = -1$ with full algebraic support	4	B3 for one value with full algebraic support Or M1 for correct method (equalising coefficients and subtracting or x,y made the subject in one and substitute) A1 for correct equation in one variable M1 for substituting value found to find other variable
15	(a)	1.65	4	M3 for $\frac{16 \times 0.5 + 12 \times 1.5 + 10 \times 2.5 + 2 \times 7.5}{40}$ Or M2 for above with other consistent value in interval (incl. 1, 2, 3, 10) Or M1 for $16 \times 0.5 + \dots$ soi by 66
	(b)	8	2	M1 for an acknowledgement of density by multiplying $4 \times$ anything
	(c)	Mean less in spring Much greater concentration at lower end in spring	1 1	
16		5.5°	4	M1 for $\sqrt{200^2 + 50^2}$ M1 for clearly trying to find the correct angle M1 for $\tan(\text{FAC}) = 20/\text{their AC}$ oe

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