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Mark Scheme (Results)

November 2009

GCSE

GCSE Mathematics (Linear) - 1380
Paper: 1380/4H

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1380_4H
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1380/4H					
Question		**Working**	**Answer**	**Mark**	**Notes**
1			**43** **25** (19) **87** (36) (42) **35** **113** (79) **67** (54) (200)	3	B3 for all 6 correct (B2 for 4 or 5 correct) (B1 for 2 or 3 correct)
2	(a)		28.38461538	2	B2 for 28.3846…. (B1 for 107.01 or 3.77 or 28.38(…) or $28\frac{5}{13}$ oe seen)
	(b)		30	1	B1ft for 30 or for answer >1sf in (a) rounded to 1 sf
3	(a)	$3 \times 2 + 5 \times -4$	-14	2	M1 for $3 \times 2 + 5 \times -4$ oe or 6 and -20 seen A1 cao for -14
	(b)		$3(m-2)$	1	B1 cao
4			Reason	1	B1 for 'The first 2 pages may not be typical of the whole magazine' oe or 'sample size too small' oe
5	(a)		Correct plane	2	B2 for a correct plane defined by showing at least 2 adjacent lines of the plane (B1 for a line of symmetry on one face)
	(b)		Correct elevation 	2	B2 for a sketch of trapezium (B1 for trapezium with a rectangle or parallelogram added at top or a side or lines drawn from vertices)

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6	(i)		45	1	B1 cao
	(ii)			1	B1 (dep) for corresponding angles (accept F angles) or any other complete reason that includes properties of parallel lines e.g. alternate angles (accept Z angles) with 45 marked on diagram (or angles on a straight line = 180) or allied angles with 135 marked on diagram
7		$\pi \times 5 \times 5$	78.5	2	M1 for $\pi \times 5 \times 5$ (accept π as 3.1 or better) A1 for 77.5 to 78.6 or 25π
8		$1.72 \div 2$ (= 0.86) $7.65 \div 9$ (= 0.85)	Large box with reasons	3	M1 for $1.72 \div 2$ (= 0.86) M1 for $7.65 \div 9$ (= 0.85) A1 for large box or 9 kg with correct calculations OR M1 for $2 \div 1.72$ (= 1.162…) M1 for $9 \div 7.65$ (= 1.176…) A1 for large box or 9 kg with correct calculations OR M2 for $7.65 \times 2 \div 9$ (=1.70) or for $1.72 \div 2 \times 9$ (=7.74) A1 for large box or 9 kg with correct calculations OR M1 for 1.72×9 (= 15.48) M1 for 7.65×2 (= 15.30) A1 for large box or 9 kg with correct calculations NOTE: Accept equivalent methods for comparison

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9			Rotation 180° Centre (0, 1)	3	B1 for rotation B1 for 180 (or half turn) B1 for (0, 1) OR B1 for enlargement B1 for scale factor −1 B1 for (0, 1) (B0 for any combination of transformations)
10		$360 + \frac{17.5}{100} \times 360$	423	3	M1 for $\frac{17.5}{100} \times 360$ oe or 10% + 5% + 2.5% oe (condone 1 calculation error) or 63 seen or 36, 18 and 9 seen M1 (dep) for 360 + '63' A1 for 423 OR M2 for 1.175×360 oe A1 for 423
11	(a)		Negative	1	B1 cao
	(b)		117 – 123	2	M1 for a line of best fit drawn between (9, 130) & (9, 140) and between (13, 100) & (13,110) inc.. A1 for 117 – 123 inclusive

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12	(a)	$2x + 9 + 2x - 3 + 4x + 5$	$8x + 11$	2	M1 for attempting to add $2x + 9$, $2x - 3$ and $4x + 5$ or for $8x + c$, $c \neq 0$ A1 for $8x + 11$
	(b)	$8x + 11 = 39$ $8x = 28$	3.5	2	M1 for "ax (+ c) " = 39 or (39 – 'c') ÷ 'a' A1f.t. for 3.5 oe provided 'c' $\neq 0$ in (a)
13		$180 \div 9$ (=20) 20×4	80	3	M2 for $180 \div (2 + 3 + 4) \times 4$ or 40, 60, 80 seen (M1 for $180 \div (2 + 3 + 4)$ or 20 seen A1 cao
14		3→ 33 4 → 72 3.1 → 35.9(91) 3.2 → 39.1(68) 3.3 → 42.5(37) 3.4 → 46.1(04) 3.5 → 49.8(75) 3.6 → 53.8(56) 3.7 → 58.0(53) 3.8 → 62.4(72) 3.9 → 67.1(19) 3.75 → 60.2(34375)	3.7	4	B2 for a trial between 3.7 and 3.8 inclusive (B1 for a trial between 3 and 4 inclusive) B1 for a different trial between 3.7 and 3.8 exclusive B1 (dep on at least one previous B1) for 3.7 NB Trials should be evaluated to at least 1dp truncated or rounded

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15	(a)		m^7	1	B1 for m^7, (accept m^{3+4})
	(b)		p^4	1	B1 for p^4, (accept p^{7-3})
	(c)		$12\,x^3y^5$	2	B2 cao (B1 for two of 12, x^3, y^5, ignore × signs)
16		$14^2 + 12^2$ $= 196 + 144 = 340$ $\sqrt{340} = 18.4\ldots$	18.4	3	M1 for $14^2 + 12^2$ M1 (dep) for $\sqrt{14^2 + 12^2}$ A1 for 18.4 to 18.44
17	(a)		9, –3, 3	2	B2 for all three correct (B1 one or two correct)
	(b)			2	B1 ft for all 7 'points' plotted correctly ± 1 square B1 ft (indep) for a smooth curve through6 or 7 of their plotted points provided at least B1 awarded in (a), with 6 or 7 points correctly plotted and (1, –3) & (2, –3) not joined with a straight line
18	(a)		$150 \leq h < 160$	1	B1 for $150 \leq h < 160$ (accept 150 to 160)
	(b)	$(125 \times 8) + (135 \times 16) + (145 \times 25) + (155 \times 30) + (165 \times 21)$ $= 1000 + 2160 + 3625 + 4650 + 3465$ $= 14900$ $14900 \div 100$	149	4	M1 for $f \times h$ for at least 3 consistent values of h in or at either end of intervals M1 (dep) for use of all correct mid-interval values (for 1st interval accept 124.5 to 125) M1 (dep on 1st M1) for $\sum fh \div \sum f$ A1 cao

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Question		**Working**	**Answer**	**Mark**	**Notes**
19	(a)	$x^2 - 3x + 5x - 15$	$x^2 + 2x - 15$	2	B2 for $x^2 + 2x - 15$ (B1 for $x^2 - 3x + 5x - 15$ with at least 3 terms correct or 4 terms correct ignoring signs)
	(b)	$\frac{29 - x}{4} \times 4 = x \times 4 + 5 \times 4$ $29 - 20 = 4x + x$ $5x = 9$	1.8	3	M1 for multiplying through by 4 or $\frac{29}{4} - \frac{x}{4} = x + 5$ M1 for correct rearrangement of their 4 terms to separate x and non-x terms A1 for 1.8 oe
20	(a)	$121 + 136 + 71 + 32 = 360$ $360 \div 4 = 90$	90	2	M1 for $(121 + 136 + 71 + 32) \div 4$ or $360 \div 4$ A1 cao
	(b)		increasing	1	B1 for increasing (cost of gas) oe
21		$132.88 \div 88 \times 100$	151	3	M1 for recognising that 88% is equivalent to 132.88 M1 for $132.88 \div 88 \times 100$ oe A1 cao
22	(a)	$6 \times \frac{15}{10}$	9	2	M1 for sight of $\frac{15}{10}$ or $\frac{10}{15}$ or $\frac{10}{6}$ or $\frac{6}{10}$ oe seen A1 cao **NB** ratios get M0 unless of the form 1:n
	(b)	$12 \times \frac{10}{15}$ oe	8	2	M1 for correct use of $\frac{15}{10}$ or $\frac{10}{15}$ or $\frac{15}{12}$ or $\frac{12}{15}$ or $\frac{"9"}{6}$ or $\frac{6}{"9"}$ oe A1 for 8 or ft from $12 \times 6 \div$ '9'

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Question		**Working**	**Answer**	**Mark**	**Notes**
23		$\cos x = \frac{8.2}{10.6} = 0.77358\ldots$ $x = \cos^{-1}\frac{8.2}{10.6} = 39.323\ldots$	39.3	3	M1 for $\cos x = \frac{8.2}{10.6}$ or $\cos\frac{8.2}{10.6}$ M1 for $\cos^{-1}\frac{8.2}{10.6}$ A1 for 39.3 – 39.33 SC: M2A0 for 0.686 or 43.69 or 39.2 or 39.37… or 39.4
24		$85 \div 382 \times 50$	11	2	M1 for $85 \div 382 \times 50$ oe or 11.1(…) seen A1 cao
25	(a)	$y = kx$ $10 = k \times 500$	$y = \frac{1}{50}x$	3	M2 for $10 = k \times 500$ oe or $10 = \frac{500}{k}$ oe (M1 for $y = kx$ or $y = \frac{x}{k}$ or $y \propto x$) A1 for $y = \frac{1}{50}x$ oe (eg $y = 0.02x$)
	(b)		7	1	B1 ft from linear $y = kx$

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26	(a)	$0.5 \times 5 \times 8 \times \sin 75$	19.3	2	M1 for $0.5 \times 5 \times 8 \times \sin 75$ A1 for 19.3 – 19.32 SC M1A0 for 7.7(5..) or – 7.7(5..) or 18.4(7..) seen
	(b)	$AB^2 = 5^2 + 8^2 - 2\times5\times8\times\cos75$ $= 25+64-80\times\cos75 = 68.29\ldots$ $AB = \sqrt{89 - 80 \times \cos 75}$ $= 8.264\ldots$	8.26	3	M1 for $AB^2 = 5^2 + 8^2 - 2 \times 5 \times 8 \times \cos75$ M1 (dep) for 89 − '80' cos 75 A1 for 8.26 (4…) SC M1M1A0 for 3.9(0..) or 7.6(4..) seen
27	(a)		30 60	2	B1 cao B1 cao
	(b)		fd = 1.5 (ht 3cm) fd = 0.5 (ht 1cm)	2	M1 for at least one correct frequency density calculated for the last 2 bars (could be implied by one correct bar) or 1 sq = 5 cars A1 cao
28		Upper bound $\sqrt{\frac{6.435}{5.5135}} = 1.080340$ Lower bound $\sqrt{\frac{6.425}{5.5145}} = 1.079402$	1.08 because the LB and UB agree to that number of figures	5	B1 for either 6.435 or 6.425 or 6.434999… B1 for either 5.5145 or 5.5135 or 5.5144999… M1 for '6.435' ÷ '5.5135' where 6.43<'6.435'≤6.44 and where 5.513 ≤ '5.5135' < 5.514 OR for '6.425'÷ '5.5145 where 6.42≤'6.425'<6.43 and where 5.514 < '5.5145' ≤ 5.515 A1 for 1.0794(02…) and 1.0803(40…) A1 for 1.08 **and** 'both LB and UB round to 1.08' oe

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Question		**Working**	**Answer**	**Mark**	**Notes**
29		$4(2x-1)+3(x+3)$ $=(x+3)(2x-1)$ $8x-4+3x+9$ $=2x^2-x+6x-3$ $2x^2-6x-8=0$ $2(x-4)(x+1)=0$	$x=-1,\ 4$	5	M1 multiplying both sides by a common denominator of $(x+3)(2x-1)$ oe or $\dfrac{4(2x-1)+3(x+3)}{(x+3)(2x-1)}$ $(=1)$ or better seen or multiplying all 3 terms by $(x+3)$ or by $(2x-1)$ M1 (indep) for $2x^2-x+6x-3$ oe seen or $8x-4+3x+9$ oe A1 for $2x^2-6x-8$ oe or $x^2-3x-4\ (=0)$ M1 (dep on M2) for correct method to solve a 3 term quadratic A1 cao for both solutions

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