edexcel :::
advancing learning, changing lives

Mark Scheme (Results)
Summer 2010

GCSE

GCSE Mathematics (1380)
Paper 4H

Edexcel is one of the leading examining and awarding bodies in the UK and throughout the world. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers.

Through a network of UK and overseas offices, Edexcel's centres receive the support they need to help them deliver their education and training programmes to learners.

For further information please call our Customer Services on + 44 1204 770 696, or visit our website at www.edexcel.com.

If you have any subject specific questions about the content of this Mark Scheme that require the help of a subject specialist, you may find our Ask The Expert email service helpful.

Ask The Expert can be accessed online at the following link:

http://www.edexcel.com/Aboutus/contact-us/

NOTES ON MARKING PRINCIPLES

1   Types of mark
        M marks: method marks
        A marks: accuracy marks
        B marks: unconditional accuracy marks (independent of M marks)

2   Abbreviations
        cao – correct answer only   ft – follow through
        isw – ignore subsequent working   SC: special case
        oe – or equivalent (and appropriate)   dep – dependent
        indep - independent

3   No working
        If no working is shown then correct answers normally score full marks
        If no working is shown then incorrect (even though nearly correct) answers score no marks.

4   With working
        If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.
        If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.
        If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks. Send the response to review, and discuss each of these situations with your Team Leader.
        If there is no answer on the answer line then check the working for an obvious answer.
        Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks. Discuss each of these situations with your Team Leader.
        If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.

5   Follow through marks
        Follow through marks which involve a single stage calculation can be awarded without working since you can check the answer yourself, but if ambiguous do not award.

Follow through marks which involve more than one stage of calculation can only be awarded on sight of the relevant working, even if it appears obvious that there is only one way you could get the answer given.

6   Ignoring subsequent work
It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: e.g. incorrect canceling of a fraction that would otherwise be correct
It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect e.g. algebra.
Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

7   Probability
Probability answers must be given a fractions, percentages or decimals. If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).
Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.
If a probability answer is given on the answer line using both incorrect and correct notation, award the marks.
If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

8   Linear equations
Full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously indicated in working (without contradiction elsewhere). Where the correct solution only is shown substituted, but not identified as the solution, the accuracy mark is lost but any method marks can be awarded.

9   Parts of questions
Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.
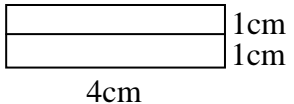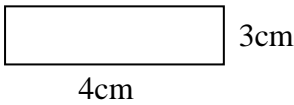
10   Use of ranges for answers
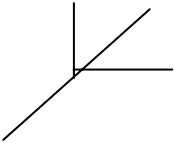If an answer is within a range this is inclusive, unless otherwise stated.

1380/4H				
Question	Working	Answer	Mark	Notes
1	120×1.5 8×1.5 420×1.5 180×1.5	180 12 630 270	3	M1 for $\times 6 \div 4$ or $\dfrac{6}{4}$ or ÷4×6 oe (120+60) or 1.5 seen or sight of any one of the four correct answers A1 for 2 or more correct answers A1 for 4 correct answers
2 (a)		Info plotted at (6.1, 32)	1	B1 for a correct plot ± 2mm
(b)		positive	1	B1 for positive (correlation)
(c)		6.6 to 7.6	2	M1 for single straight line segment with positive gradient that could be used as a line of best fit or an indication on the diagram from 40 on the umbrella axis. A1 for an answer in the range 6.6 to 7.6 inclusive.

Question		Working	Answer	Mark	Notes
3	(a)	1.25×620	775	2	M1 for 1.25×620 oe A1 cao
	(b)	$50 \div 1.25 = 40$ $42 - 40$ or $42 \times 1.25 = 52.5$ $52.5 - 50 = 2.50$	2	3	M1 for $50 \div 1.25$ (=40) oe M1 (dep) for $42 - "40"$ or "40" - 42 A1 cao for £2 OR M1 for $42 \times 1.25 (= 52.5)$ oe M1 (dep) for "52.5"-50 or 50 – "52.5" A1 cao for £2 [A0 for €2.5(0) or £2.5(0) without any working] SC: Award B2 for -£2
4	(a)		–2, 4, 7	2	B2 for a fully correct table (B1 for 1 or 2 correct entries)
	(b)		Straight line from (–2, –2) to (2, 10)	2	B2 for correct straight line from (–2, –2) to (2, 10) (B1 ft for at least 4 correctly plotted points OR a single straight line passing through (0, 4) OR for a single line of gradient 3)

Question		Working	Answer	Mark	Notes
5	(i)	180 − 68	112	3	B1 cao
	(ii)				B1 for 'alternate angles' or Z angles or 'corresponding angles' or F angles or B1 for '(angles on a straight) line $=180$' Alternative: B1 for 'allied angles' or 'co-interior angles' or B1 for '(vertically) opposite angles'
6	(a)	$\dfrac{2}{3.95}$	0.5063(29113...)	2	B2 for 0.5063 or better. (B1 for 0.5 or 0.50 or 0.506 or 0.51 or 3.95 or the fraction $\dfrac{40}{79}$ seen)
	(b)		0.51	1	B1 ft for 0.51 from their answer to part (a) which is written to two or more decimal places.
7		$\pi \times 12$	37.7	2	M1 for $\pi \times 12$ accept π as $\dfrac{22}{7}$ or 3.1 or better A1 for an answer in the range 37.6 to 37.8

Question	Working	Answer	Mark	Notes
8	$x = 1$ gives 11 $x = 2$ gives 28 $x = 1.5$, gives 18.(375) $x = 1.6$, gives 20.(096) $x = 1.7$, gives 21.(913) $x = 1.8$, gives 23.(832) $x = 1.9$, gives 25.(859) $x = 1.85$, gives 24.8(316..) $x = 1.86$, gives 25.(03..) $x = 1.87$, gives 25.2(3..) $x = 1.88$, gives 25.4(4..) $x = 1.89$, gives 25.6(5..)	1.9	4	B2 for a trial $1.8 \leq x \leq 1.9$ evaluated (B1 for a trial $1 \leq x \leq 2$ evaluated) B1 for a different trial $1.85 \leq x < 1.9$ evaluated B1 (dep on at least one previous B1) for 1.9 Accept trials correct to the nearest whole number (rounded or truncated) if the value of x is to 1dp but correct to 1dp (rounded or truncated) if the value of x is to 2dp. NB: no working scores no marks even if answer is correct.
9	$\dfrac{84}{350} \times 100$	24	2	M1 for $\dfrac{84}{350} \times 100$ A1 cao
10 (a)	$1 - (0.15 + 0.3 + 0.35) =$	0.20	2	M1 for $1 - (0.15 + 0.3 + 0.35)$ A1 for 0.2 oe
(b)	0.30×500	150	2	M1 for 0.30×500 A1 cao NB: $\dfrac{150}{500}$ etc. gets M1 A0 but "150 out of 500" gets M1 A1

Question	Working	Answer	Mark	Notes
11 (a)		Base angles of an isosceles triangle are equal	1	B1 mentions isosceles (triangle) or two sides the same or base angles equal. Accept equivalent reasons. Do not accept incorrect statements.
(b)	$2x = 40$	20	2	M1 for an attempt to move x to LHS or -10 to RHS eg $-x$ each side or +10 each side or sight of $2x$ or 40 OR to move $3x$ or +30 or sight of $-2x$ or -40 A1 cao
12 (a)	$0.5 \times 6 \times 14$	42	2	M1 for $0.5 \times 6 \times 14$ oe A1 cao
(b)	$\sqrt{6^2 + 14^2} = \sqrt{232}$	15.23	3	M1 for $6^2 + 14^2$ or 36+196 or 232 M1 for $\sqrt{36 + 196}$ or $\sqrt{232}$ A1 for answer in the range 15.2 to 15.3
13 (a)		Plan shown as two rectangles 1cm by 4cm	2	B2 cao (B1 for a rectangle 4 cm x 1 cm or a rectangle 4 cm x 2 cm. Could be attached to other rectangles.) Do not accept rectangles with additional external lines.
(b)			2	B2 cao (B1 for a rectangle with one correct dimension) Do not accept rectangles with additional external lines. NB: any orientation possible; ignore internal lines.

Question		Working	Answer	Mark	Notes
14		(20×3 + 60×5 + 100×12 + 140×7 + 180×3) ÷ 30 = (60 + 300 + 1200 + 980 + 540) ÷ 30= = 3080 ÷ 30 Alternative: (20.5×3 + 60.5×5 + 100.5×12 + 140.5×7 180.5×3) ÷ 30 = 3080 ÷ 30	102.7 103.2	4	M1 for f×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 (accept 20-20.5 etc) M1 (dep on at least M1 scored) for $\sum fh \div 30$ A1 for 102.6 - 103.2
15	(a)		−3, −2, −1, 0, 1	2	B2 for all 5 correct values; ignore repeats, any order. (−1 for each omission or additional value)
	(b)	$3x - x > 7 + 2$ $2x > 9$	$x > 4.5$	2	M1 for an attempt to move x to LHS or -2 to RHS eg $-x$ each side or $+2$ each side or sight of 2x or 9 or 2*x*>9 or sight of 2*x* on LHS of (in)equality or 9 on RHS of (in)equality. eg. 3*x* − *x* > 7 + 2 A1 oe Allow $x > 4\dfrac{1}{2}$, $x > \dfrac{9}{2}$ [SC: B1 for *x* = 4.5, *x*<4.5 if M0 scored]
16				2	B2 for correct locus within guidelines (overlay) (B1 for a line drawn parallel to either given line OR a line passing through the angle outside of the guidelines OR a line drawn within the guidelines but not passing through angle)

Question	Working	Answer	Mark	Notes
17	$r^2 = \dfrac{A}{3}$	$A = 3r^2$	2	M1 for an attempt to square both sides $r^2 = \dfrac{A}{3}$ or an attempt to multiply both sides by $\sqrt{3}$ A1 cao
18 (a)		1.55×10^4	1	B1 cao
(b)		0.00248	1	B1 cao
(c)	$24500 \div 0.000125 = 196000000$	1.96×10^8	2	B2 cao (B1 for 196000000 or $1.96 \times 10^4 \times 10^4$ oe or 1.96×10^n or digits 196×10^n where n is a number other than 8, or absent.)
19 (a)		$(x-2)(x-5)$	2	M1 for $(x \pm 2)(x \pm 5)$ A1 for $(x-2)(x-5)$
(b)		$x = 2,\ x = 5$	1	B1 cao or ft from (a)
20	$\cos 58^\circ = \dfrac{AB}{16}$ $AB = 16 \times \cos 58^\circ = 8.4787$	8.48	3	M1 for $\cos 58^\circ = \dfrac{AB}{16}$ M1 (dep) for $16 \times \cos 58^\circ$ A1 for 8.47- 8.48 [SC:M2 A0 for 1.9-1.91 [RAD] or 9.8-9.81 [GRAD]]

Question	Working	Answer	Mark	Notes
21 (a)		28.5	1	B1 for 28.5 or 2850 cm or 28.499 or 28.49… or 28.49 recurring oe
(b)	$2 \times (147.5 + 28.5)$	352	3	B1 for upper bound of length = 147.5 or 14750 cm or 147.49 recurring oe M1 for 2 × ("upper bound width" + "upper bound length") where these are not the given values. A1 cao 351.999-352
22 (a)	p^{5+4}	p^9	1	B1 (accept p^{5+4})
(b)	q^{5-2}	q^3	1	B1 (accept q^{5-2})
(c)		$2u$	2	B2 (accept $2t^0u$, $2t^0u^1$oe) (B1 for 2 correct terms from 2, t^0 and u oe eg u^1)
(d)		$3wy^3$	2	B2 cao (B1 for 2 correct terms from 3, w and y^3 oe) NB: accept w^1 for w.
(e)		$x^{-2} \quad x^0 \quad x^{\frac{1}{2}} \quad x \quad x^2$	2	B2 cao (B1 for any 4 in relative correct order, or all correct but in reverse order)

Question	Working	Answer	Mark	Notes
23	50 : 18 = 25 : 9 Ratio of length = 5 : 3 Ratio of volume = 125 : 27 $500 \times \dfrac{27}{125}$	108	4	M1 for ratio of length $=\sqrt{50}:\sqrt{18}$ or $\sqrt{25}:\sqrt{9}$ (or 5 : 3 or 3 : 5 seen) or 1.66-1.67 or 0.6 M1 for ratio of volume (mass) = "5"^{3} : "3"^{3} or $25^{\frac{3}{2}} : 9^{\frac{3}{2}}$ oe or 4.62-4.63 or 0.216 M1 (dep on at least M1) for $500 \times$ " $\dfrac{9^{\frac{3}{2}}}{25^{\frac{3}{2}}}$ " or $500 \div$ "4.62" or $500 \div$ "4.63" or $500 \times$ "0.216" A1 cao [NB: ratios do not need to be presented as ratios as long as the relationship is clear]
24 (a)	Explanation: Each member of the population has an equal chance of selection		1	B1 for explanation
(b)	Description: Eg. number each stamp and use random select on calculator.		1	B1 for an acceptable description
(c)	$50 \times \dfrac{95}{662} = 7.175....$	7	2	M1 for $50 \times \dfrac{95}{662}$ or 7.1, 7.2, 7.17, 7.18, 7.175... A1 Accept 7 or 7.0

Question	Working	Answer	Mark	Notes
25 (a)		12, 6	2	M1 for frequency density calculation (implied by one answer), or 1cm^2=2 (trains), or fd=0.5 or 8cm^2=16 A1 both 12 and 6
(b)	Bar of height 5cm (5-10) Bar of height 1cm (30-50)	Height 5cm Height 1cm	2	M1 for frequency density calculation (implied by one correct bar) or 1cm^2=2 (trains) or fd=0.5 A1 for bar of height 5cm (5 to 10) AND for bar of height 1 cm (30 to 50) 8cm^2=16
26	$\dfrac{40}{360} \times \pi \times 8^2 - \dfrac{1}{2} \times 8^2 \times \sin 40^o$ = 22.34.... – 20.569... OR $\dfrac{40}{360} \times \pi \times 8^2 -$ $8 \times \sin 20^o \times 8 \times \cos 20^o$ = 22.34.... – 20.569...	1.77	5	M1 for $\dfrac{40}{360}$ oe seen or $0.1\dot{1}$ seen or ÷9 M1 for $\dfrac{40}{360} \times \pi \times 8^2$ oe or sight of 22.3-22.35 M1 for $\dfrac{1}{2} \times 8^2 \times \sin 40^o$ or $8 \times \sin 20 \times 8 \times \cos 20$ or sight of 20.56-20.57 M1 (dep on at least one M1 scored) for the intention to find the difference between the area of triangle *OPS* and the area of sector *OPRS* A1 for 1.74 -1.78 [B3: RAD: ±1.50(340...) or GRAD: 3.53(108...)]
27 (a)		$y = f(x - 5)$	1	B1 cao
(b)		(4, 3)	2	B2 cao (B1 for one coord. correct (in correct position) or (3,4).)

Further copies of this publication are available from
International Regional Offices at www.edexcel.com/international

For more information on Edexcel qualifications, please visit www.edexcel.com
Alternatively, you can contact Customer Services at www.edexcel.com/ask or on + 44 1204 770 696

Edexcel Limited. Registered in England and Wales no.4496750
Registered Office: One90 High Holborn, London, WC1V 7BH