

Edexcel GCSE

Mathematics 2544

Summer 2008

advancing learning, changing lives

Mark Scheme (Results)

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-international.org.

Publication Code: UG020314

June 2008

All the material in this publication is copyright

© Edexcel Ltd 2008

Table Of Contents

1.	5542F/08	-----	-----	-----	-----	-----	4
2.	5542H/09	-----	-----	-----	-----	-----	7
3.	5543F/10	-----	-----	-----	-----	-----	11
4.	5543H/11	-----	-----	-----	-----	-----	16
5.	5544F/12F	-----	-----	-----	-----	-----	21
6.	5544F/13F	-----	-----	-----	-----	-----	28
7.	5544H/14H	-----	-----	-----	-----	-----	33
8.	5544H/15H	-----	-----	-----	-----	-----	42

5542F/8A				
Question	Working	Answer	Mark	Notes
A1 (a)		Blonde	1	B1 for blond or blonde
(b)		Becky	1	Accept different spelling as long as intention is clear. B1 cao
(c)	$(6+10+6+9+4)\div 5$	7	2	Accept different spelling as long as intention is clear. M1 for attempt to add the 5 ages (condone 1 error) and divide by 5 A1 cao
A2 (a)		Wednesday	2	B1 for Wednesday
(b)	$30+50+70+170$	Friday 320	2	B1 for Friday M1 for addition of 4 times (condone 1 error) A1 (accept 320 – 324)
A3		149, 133 125, 407 154, 123, 147, 424 303, 256, 272 , 831	3	B3 for fully correct table. (B1 for 2 or 3 correct entries) (B2 for 4 or 5 correct entries)
A4		e.g. How many times each week do you shop at this supermarket? 0, 1, 2, 3, 4 or more	2	B1 for an appropriate question with a reference to a time period OR a question with time period implied by responses. B1 for at least 3 non-overlapping boxes (ignore if not exhaustive) Do not accept frequency tables or data collection sheets.
A5	$1-(0.2+0.35+0.2)$	0.25	2	M1 for $1-(0.2+0.35+0.2)$ A1 for 0.25 oe SC: B1 for “1 out of 4” or “1 in 4” SC: B1 if 0.25 seen in the table with incorrect answer on answer line.

5542F/8B				
Question	Working	Answer	Mark	Notes
B1 (a)	I III III III III II	Tallies and frequencies 1, 4, 5, 3, 7	2	M1 for at least 3 correct tallies or at least 3 correct frequencies A1 for all frequencies correct.
(b)		20	1	B1 for 20 or ft from frequencies in (a) or tallies if no frequencies
(c)		USA	1	B1 for USA or ft from (a)
B2		Even, certain, likely	3	B3 for all 3 additional lines correct (B1 for each additional line correct)
B3 (a)	64 - 25	39	2	M1 for sight of 25 and 64 A1 cao
(b)		49	1	B1 cao
B4		$\frac{3}{8}$	2	M1 for $\frac{x}{8}$ ($x < 8$) or $\frac{3}{x}$ ($x > 3$) A1 for $\frac{3}{8}$ o.e. (SC B1 for '3 in 8' or '3 out of 8')

5542F/8B				
Question	Working	Answer	Mark	Notes
B5 (a)		height increases with weight	1	B1 for increase in height with weight (accept positive correlation)
(b)		line of best fit drawn (overlay)	1	B1 for line between (40,145) and (40, 150) and between (50, 156) and (50, 161)
(c)			1	B1if 152.5 – 157.5 seen or ft from their line dependent on positive gradient

5542H/9A				
Question	Working	Answer	Mark	Notes
A1 (a)	$1-(0.2+0.35+0.2)$	0.25	2	M1 for $1-(0.2+0.35+0.2)$ A1 0.25 oe SC: B1 for “1 out of 4” or “1 in 4” SC: B1 if 0.25 seen in the table with incorrect answer on answer line.
(b)	100×0.35	35	2	M1 for 100×0.35 A1 cao
A2		e.g. How many times each week do you shop at this supermarket? 0, 1, 2, 3, 4 or more	2	B1 for an appropriate question with a reference to a time period OR a question with time period implied by responses. B1 for at least 3 non-overlapping boxes (ignore if not exhaustive) Do not accept frequency tables or data collection sheets.
A3 (a)	$(25+30+29) \div 3$	28	2	M1 for $(25+30+29) \div 3$ or $84 \div 3$ (condone missing brackets) A1 cao
(b)			1	B1 for plotting 3 points (6, 26), (7, 27), (8, 26)
(c)			1	B1 for trend line between (2, 24) and (2, 26.5) and between (8, 25) and (8, 27.5)
(d)		trend is upwards	1	B1 for trend is upwards oe
A4	$\frac{167}{1385} \times 50$	6 or 7	2	M1 for $\frac{167}{1385} \times 50$ or 6.02..... or 6.03 or $\frac{1670}{277}$ or $6\frac{8}{277}$ A1 for 6 or 7

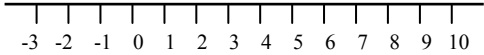
5542H/9B				
Question	Working	Answer	Mark	Notes
A5	$2\text{cm}^2 = 1$ battery	20	2	M1 for use of frequency density or area Sight of 2×1 , 6×0.5 , 14×0.5 , 8×0.5 , 4×1 OR $4 \div 2$, $6 \div 2$, $14 \div 2$, $8 \div 2$, $8 \div 2$ OR 2, 3, 7, 4, 4 (condone 1 error or omission) A1 cao

5542H/9B																								
Question	Working	Answer	Mark	Notes																				
B1 (a)		height increases with weight	1	B1 for increase in height with weight (accept positive correlation)																				
(b)		line of best fit drawn (overlay)	1	B1 for line between (40, 145) and (40, 150) and between (50, 156) and (50, 161)																				
(c)			1	B1 if 152.5 – 157.5 seen or ft from their line dependent on positive gradient.																				
B2		<table style="margin-left: auto; margin-right: auto;"> <tr><td style="border-right: 1px solid black; padding-right: 5px;">2</td><td>6</td><td>9</td><td>9</td></tr> <tr><td style="border-right: 1px solid black; padding-right: 5px;">3</td><td>1</td><td>5</td><td></td></tr> <tr><td style="border-right: 1px solid black; padding-right: 5px;">4</td><td>0</td><td>0</td><td>1 8 9</td></tr> <tr><td style="border-right: 1px solid black; padding-right: 5px;">5</td><td>1</td><td>4</td><td>7 7 7</td></tr> <tr><td style="border-right: 1px solid black; padding-right: 5px;">6</td><td>0</td><td>3</td><td>5</td></tr> </table> <p style="text-align: center;">Key: 2 6 = 26</p>	2	6	9	9	3	1	5		4	0	0	1 8 9	5	1	4	7 7 7	6	0	3	5	3	B3 for fully correct diagram with key (B2 for ordered leaves (with one error or omission) and a key OR unordered leaves and key) (B1 for unordered leaves (with an error or omission) OR key)
2	6	9	9																					
3	1	5																						
4	0	0	1 8 9																					
5	1	4	7 7 7																					
6	0	3	5																					

5542H/9B				
Question	Working	Answer	Mark	Notes
B3	$\frac{3}{8} \times \frac{2}{7}$	$\frac{6}{56}$	3	M1 for $\frac{2}{7}$ seen as non-replacement M1 for $\frac{3}{8} \times \frac{2}{7}$, $\frac{3}{8} \times \frac{3}{8}$, $\frac{3}{8} \times \frac{2}{8}$, $\frac{3}{8} \times \frac{3}{7}$ oe seen A1 for $\frac{6}{56}$ o.e.
B4 (a)		(4) 23, 57, 84, 98, 100	1	B1 for all correct
(b)		cf curve	2	B1 for 5-6 of their points correctly plotted (± 1 square) at end of interval B1 for points joined by a curve or line segments provided no gradient is negative.
(c)		“median”	1	B1 for 67.5 – 69.5 seen or ft (± 1 square) from their cf graph at 50 – 50.5 down (± 1 square)
(d)		15	2	M1 for 60 – 62 and 75 – 77 seen or ft (± 1 square) from their c.f. graph A1 13–17 seen or ft from their c.f. graph.

5543F/10A				
Question	Working	Answer	Mark	Notes
A1 (a)		900	1	B1 for 900 (accept 9 hundred, nine hundred)
(b)		Two thousand eight hundred and five	1	B1 accept twenty eight hundred and five
(c)		5460	1	B1 cao
A2		kite	1	B1 cao
A3 (a)		1250, 2501, 5201, 5210	1	B1 cao
(b)		0.7, 0.705, 0.75	1	B1 for 0.7, 0.705, 0.75 (accept 70%, 70.5%, 75% or $\frac{7}{10}, \frac{705}{100}, \frac{75}{100}$)
A4 (a)		12	1	B1 cao
(b)		8	1	B1 cao [If no answer on the answer line, check the diagram]
A5 (a)		(1, 4)	1	B1 cao
(b)		(5, -2) plotted	1	B1 cao (condone omission of label Q)
(c)(i)		midpoint at (3,2) marked	2	B1 for identification of midpoint (within ± 2 mm)
(ii)		(3, 2)		B1 cao
A6 (a)		-7 (-3) 1 (5) 9	2	B2 for all values correct (B1 for 1 or 2 values correct)
(b)		Line from (-1,-7) to (3,9)	2	B2 for correct line from (-1,-7) to (3,9) (B1 ft for 4 of their points plotted correctly) [SC B1 for any single line through (0, -3) or any single line of gradient 4]

5543F/10A													
Question	Working	Answer	Mark	Notes									
A7	$180^\circ - 50^\circ - 70^\circ$	60	2	M1 for $180^\circ - "(50^\circ + 70^\circ)"$ or $"180^\circ - 70^\circ - 50^\circ"$ or $"180^\circ - 50^\circ - 70^\circ"$ A1 cao									
A8	(a) $2 \times 2 \times 11$ 7×11	11	2	M1 for listing factors of each number (could be in factor trees) – condone one error in each list (tree) or for $2 \times 2 \times 11$ and 7×11 A1 cao									
	(b) eg <table style="display: inline-table; border-collapse: collapse; vertical-align: middle;"> <tr><td style="border-right: 1px solid black; padding: 2px 5px;">2</td><td style="padding: 2px 5px;">200</td></tr> <tr><td style="border-right: 1px solid black; padding: 2px 5px;">2</td><td style="padding: 2px 5px;">100</td></tr> <tr><td style="border-right: 1px solid black; padding: 2px 5px;">2</td><td style="padding: 2px 5px;">50</td></tr> <tr><td style="border-right: 1px solid black; padding: 2px 5px;">5</td><td style="padding: 2px 5px;">25</td></tr> <tr><td style="border-right: 1px solid black; padding: 2px 5px;"></td><td style="padding: 2px 5px;">5</td></tr> </table>	2	200	2	100	2	50	5	25		5	$2 \times 2 \times 2 \times 5 \times 5$	2
2	200												
2	100												
2	50												
5	25												
	5												
A9	(a)	27.034.....	2	B2 for 27.034(3336) (B1 for 53.29 or 36.99 seen)									
	(b)	27.0	1	B1 ft [Note: An answer of 27 or 27.00 only is not acceptable]									

5543F/10B				
Question	Working	Answer	Mark	Notes
B1 (a)(i)		12	2	M1 for 6×2 or $4+4+2+2$ A1 for 12 If no working shown: B2 for 12 (B1 for 10 or 11)
B2 (a) (b)	$10 - -3$ 	Oslo 13 or -13	1 2	B1 (accept -8) B2 for 13 (accept -13) [B1 for $10 - -3$ oe or $-3 -10$ oe or a number line drawn from at least -3 to +10]
B3 (a)(i) (ii) (b)		grams centimetres or millimetres 7000	2 1	B1 for g, grams B1 for cm, centimetres, mm or millimetres B1 cao
B4 (a) (b)		3 Subtract 4 from previous term	1 1	B1 cao B1 for subtract 4 oe (i.e. an explanation which includes 'taking 4')
B5 (a) (b) (c)		64 10 125	1 1 1	B1 cao B1 for 10 (accept -10 or ± 10) B1 cao [Ignore any mention of units in any part]

5543F/10B																
Question	Working	Answer	Mark	Notes												
B6	$\begin{array}{r} 745 \\ \times 23 \\ \hline 2235 \\ 14900+ \\ \hline 17135 \end{array}$ $\begin{array}{r} 23 \\ \times 745 \\ \hline 115 \\ 920 \\ \hline 16100+ \\ \hline 17135 \end{array}$ <table border="1" style="display: inline-table; margin-left: 20px;"> <tr> <td>700</td> <td>40</td> <td>5</td> <td>X</td> </tr> <tr> <td>14000</td> <td>800</td> <td>100</td> <td>20</td> </tr> <tr> <td>2100</td> <td>120</td> <td>15</td> <td>3</td> </tr> </table> $14000 + 800 + 100 + 2100 + 120 + 15 = 17135$	700	40	5	X	14000	800	100	20	2100	120	15	3	17135	3	<p>M1 for a complete method with relative place value correct, condone 1 multiplication error, addition not necessary. M1 intent to add. (dep on 1st M1) A1 cao</p> <p>OR</p> <p>M1 for a completed grid condone multiplication error, addition not necessary. M1 intent to add. (dep on 1st M1) A1 cao</p> <p>OR</p> <p>M1 for sight of a complete partitioning method, condone 1 multiplication error, final addition not necessary. M1 intent to add. (dep on 1st M1) A1 cao</p> <p>[SC : M1 only for a list of 23 lots of 745]</p>
700	40	5	X													
14000	800	100	20													
2100	120	15	3													
B7		$\begin{array}{cc} 2n & n+1 \\ \boxtimes & \boxtimes \end{array}$	2	B1 for each correct answer (-1 for each extra)												
B8	$24 \div 2$	12	2	M1 for $24 \div 2$ or 12km in 1hour A1 cao												

5543F/10B				
Question	Working	Answer	Mark	Notes
B9 (a) (b)	$3x + 15 + 2x - 2$	$cd + 4c$ $5x + 13$	1 2	B1 for $cd + 4c$ oe B1 for $3x + 15$ or $2x - 2$ B1 cao
B10		B is the vertex on the x-axis, adjacent to A C is the vertex directly above A.	2	B2 for points <i>B</i> and <i>C</i> correctly marked (B1 for 1 point correctly marked) [SC : B1 for correct points plotted but not labelled.]

5543H/11A				
Question	Working	Answer	Mark	Notes
A1 (a) (b)		100 100	1 1	B1 cao B1 for 100° or f.t. from (a) [If no answer on the answer line, check the diagram]
A2 (a) (b)		27.034..... 27.0	2 1	B2 for 27.034..... (B1 for 53.29 or 36.99 seen) B1 ft [Note: An answer of 27 or 27.00 only is not acceptable]
A3 (a) (b)	$\frac{1}{2} \times 6 \times 6$ 18 x 10	18 180	2 2	M1 for $\frac{1}{2} \times 6 \times 6$ oe A1 cao M1 for “a” $\times 10$ or $\frac{1}{2} \times 6 \times 6 \times 10$ A1 ft
A4		$2x + 3y$	2	B2 for $2x + 3y$ oe seen (ignore any LHS = $2x + 3y$) (B1 for $2x$ or $3y$ oe)
A5	Points (-1, -7), (0, -3), (1, 1), (2, 5), (3, 9)	Straight line of gradient 4 through (0, -3) From (-1, -7) To (3, 9)	3	B3 for correct straight line from (-1, -7) to (3, 9) [B2 for 4 or 5 points plotted correctly or for a single line of gradient 4 passing through (0, -3)] [B1 for 2 or 3 points plotted correctly or for a single line of gradient 4 or for any single line (not horizontal) through (0, -3)]

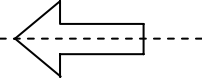
5543H/11A														
Question	Working	Answer	Mark	Notes										
A6 (a)	eg <table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>2</td><td>200</td></tr> <tr><td>2</td><td>100</td></tr> <tr><td>2</td><td>50</td></tr> <tr><td>5</td><td>25</td></tr> <tr><td></td><td>5</td></tr> </table>	2	200	2	100	2	50	5	25		5	$2 \times 2 \times 2 \times 5 \times 5$	2	M1 for a systematic method of at least 2 correct divisions by a prime number or factor tree; can be implied by digits 2,2,2,5,5 on answer line A1 for $2^3 \times 5^2$ or $2 \times 2 \times 2 \times 5 \times 5$ or
2	200													
2	100													
2	50													
5	25													
	5													
(b)	$2 \times 2 \times 11$ $2 \times 5 \times 11$	22	2	M1 for listing at least 3 correct factors of each number (condone one error in each list) or correct factor trees or correct repeated divisions. or for $2 \times 2 \times 11$ or $2 \times 5 \times 11$ A1 for 22 or 2×11 [SC: B1 for 11 if M0 scored]										
A7	$2x(5x + 3) - (5x + 3)$ $= 10x^2 + 6x - 5x - 3$ Or <table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>×</td><td>2x</td><td>-1</td></tr> <tr><td>5x</td><td>10x²</td><td>-5x</td></tr> <tr><td>+3</td><td>6x</td><td>-3</td></tr> </table>	×	2x	-1	5x	10x ²	-5x	+3	6x	-3	$10x^2 + x - 3$	3	M1 for $2x(5x + 3) - (5x + 3)$ or $2x \times 5x + 2x \times 3 - 1 \times 5x + -1 \times 3$ A1 for exactly 4 terms correct ignoring signs (eg $10x^2$, $6x$, $5x$, 3) or 3 correct terms out of no more than 4 terms with correct signs (ie 3 out of $10x^2$, $+6x$, $-5x$, -3) A1 cao	
×	2x	-1												
5x	10x ²	-5x												
+3	6x	-3												

5543H/11A				
Question	Working	Answer	Mark	Notes
A8 (a)	$\text{Angle } ABO = 90^\circ$ $\text{Angle } BAC = 180^\circ - 2 \times 75^\circ$ <u>Alternative</u> $\text{Angle } BOC = 180 - 2 \times 15 = 150$ $\text{Angle } BAC = 360 - 150 - 90 \times 2$	30	2	M1 $90 - 15 (=75)$, ie for using angle between tangent and radius is 90° A1 cao <u>Alternative</u> M1 for $360 - \text{“angle } BOC\text{”} - 90 \times 2$ ie for using angle between tangent and radius is 90° A1 cao
(b)			2	B1 for angle between <u>tangent</u> and <u>radius</u> is 90° B1 for isosceles triangle / length of tangents from point to circumference are equal. OR B1 for angle between tangent and radius is 90° B1 for isosceles triangle + angles in a quadrilateral

5543H/11B				
Question	Working	Answer	Mark	Notes
B1	$24 \div 2$	12	2	M1 for $24 \div 2$ or 12km in 1 hour [accept $24 \div 120$ or $24000 \div 2$ or $24000 \div 120$] A1 cao
B2 (a)		17.01	1	B1 cao
(b)		0.486	1	B1 cao
B3	$\frac{1+5}{2}, \frac{4+0}{2}$	(3, 2)	2	M1 for $\frac{1+5}{2}$ or $\frac{4+0}{2}$ oe A1 cao OR B1 for (a, 2) where $a \neq 3$ or (3, b) where $b \neq 2$, if M0 scored [SC: B1 for (2, 3)]
B4 (a)		$cd + 4c$	1	B1 for $cd + 4c$ oe
(b)	$3x + 15 + 2x - 2$	$5x + 13$	2	B1 for $3x + 15$ or $2x - 2$ seen B1 cao
B5		Points marked and labelled correctly on diagram B is the vertex on the x-axis, adjacent to A. C is the vertex directly above A	2	B2 for points B and C correctly marked and labelled (B1 for 1 point correctly marked) [SC : B1 for correct points plotted with no labels.]

5543H/11B				
Question	Working	Answer	Mark	Notes
B6 (a) (b)		$2(a + 3)$ $5x(x + 2y)$	1 2	B1 cao B2 for a fully correct factorization (B1 for $5(x^2 + 2xy)$ or $x(5x + 10y)$ or $5x(\text{linear expression in } x \text{ and } y)$ or $(x + 2y)$ only).
B7 (a) (b)		1.4×10^7 0.0007	1 1	B1 cao B1 cao
B8 (i) (ii) (iii)		1 $\frac{1}{16}$ 10	3	B1 cao B1 for $\frac{1}{16}$ or 0.0625 B1 for 10 (accept -10 or ± 10)
B9 (a) (b)	$\frac{2(x+2)}{(x+2)(x+2)}$ $\frac{x-4+2(x+4)}{(x+4)(x-4)}$	$\frac{2}{x+2}$ $\frac{3x+4}{(x+4)(x-4)}$	3 3	B1 for $2(x+2)$ B1 for $(x+2)(x+2)$ or $(x+2)^2$ B1 cao M1 for common denominator of $(x+4)(x-4)$ oe M1 for $\frac{x-4}{(x+4)(x-4)}$ oe or $\frac{2(x+4)}{(x+4)(x-4)}$ oe A1 $\frac{3x+4}{(x+4)(x-4)}$ or $\frac{3x+4}{x^2-16}$ oe

5544F/12F				
Question	Working	Answer	Mark	Notes
1		29.00 6.00 68 (.00)	3	B1 (accept 29) B1 (accept 6) B1 ft for 39 + "29"
2	(a)	8 cm or 80 mm	2	B1 for 7.8 – 8.2 or 78 – 82
	(b)	Midpoint	1	B1 for appropriate unit cm or mm B1 for midpoint marked $\pm 2\text{mm}$
3	(a)	3	1	B1 for 3 or +3
	(b)	-8	1	B1 for -8 cao
	(c)	-8	1	B1 for -8 cao
4		$\frac{60}{2} \times 5 =$	3	M2 for $\frac{60}{2} \times 5$ oe or 150 seen (M1 for $\frac{60}{2}$ or 30 seen or 60×5 or 300 seen or 0.6×5 or 3(.00) seen) A1 for 1.5(0) Accept 150p with £ crossed out or £1.5(0)p
5	(a)	3 : 1	1	B1 cao
	(b)	$\frac{5}{8}$	2	B2 for 5/8 (B1 for $a/8$ with $a < 8$ or $\frac{5}{b}$ with $b > 5$)
6	(a)	360	1	B1 cao
	(b)	60	1	B1 for 60 or "the same" oe

5544F/12F				
Question	Working	Answer	Mark	Notes
7	(a)		1	B1 for completed shape cao
	(b)		1	B1 for line of symmetry drawn
8	(a)	6	1	B1 cao
	(b)	$3 \times (20 \div 4)$	2	M1 for $3 \times (20 \div 4)$ oe or $\frac{60}{4}$ or 5 seen A1 for 15 cao
9	$360 - (120 + 80 + 100)$ $= 360 - 300$	60	2	M1 for $360 - (120 + 80 + 100)$ oe A1 cao
10	(a)	10	1	B1 cao
	(b)(i)	10 00	2	B1 accept 10 or 10 o'clock (ignore am or pm)
	(ii)	30		B1 cao
	(c)	11 20	1	B1

5544F/12F					
Question		Working	Answer	Mark	Notes
11	(a)	$\frac{24}{36}$	$\frac{2}{3}$	2	B2 for $\frac{2}{3}$ cao (B1 for sight of $\frac{24}{36}$ or $\frac{12}{18}$ or $\frac{8}{12}$ or $\frac{4}{6}$ or $\frac{6}{9}$) SC: B1 for 2:3
	(b)	$5 \overline{)3.0}$ $\frac{0.6}{}$	0.6	2	M1 for $3 \div 5$ oe or $\frac{6}{10}$ oe seen or 0.2×3 A1 for 0.6(0)

5544F/12F																																																			
Question	Working	Answer	Mark	Notes																																															
12	$\begin{array}{r} 540 \\ 24 \\ \hline 2160 \\ 10800 \\ \hline 12960 \end{array}$ <table style="border-collapse: collapse; margin: 10px auto;"> <tr> <td></td> <td style="text-align: center;">5</td> <td style="text-align: center;">4</td> <td style="text-align: center;">0</td> <td></td> </tr> <tr> <td style="text-align: right;">1</td> <td style="border: 1px solid black; padding: 5px;">1 0</td> <td style="border: 1px solid black; padding: 5px;">8</td> <td style="border: 1px solid black; padding: 5px;">0</td> <td style="text-align: left;">2</td> </tr> <tr> <td style="text-align: right;">2</td> <td style="border: 1px solid black; padding: 5px;">2 0</td> <td style="border: 1px solid black; padding: 5px;">1 6</td> <td style="border: 1px solid black; padding: 5px;">0</td> <td style="text-align: left;">4</td> </tr> <tr> <td></td> <td style="text-align: center;">9</td> <td style="text-align: center;">6</td> <td style="text-align: center;">0</td> <td></td> </tr> </table> <table style="border-collapse: collapse; margin: 10px auto;"> <tr> <td></td> <td style="text-align: center;">500</td> <td style="text-align: center;">40</td> <td style="text-align: center;">0</td> <td></td> </tr> <tr> <td style="text-align: right;">20</td> <td style="border: 1px solid black; padding: 5px;">10000</td> <td style="border: 1px solid black; padding: 5px;">800</td> <td style="border: 1px solid black; padding: 5px;">0</td> <td></td> </tr> <tr> <td style="text-align: right;">4</td> <td style="border: 1px solid black; padding: 5px;">2000</td> <td style="border: 1px solid black; padding: 5px;">160</td> <td style="border: 1px solid black; padding: 5px;">0</td> <td></td> </tr> </table> <p style="text-align: center;">10000 + 2000 + 800 + 160 = 12960</p> <table style="border-collapse: collapse; margin: 10px auto;"> <tr> <td></td> <td style="text-align: center;">5</td> <td style="text-align: center;">0.4</td> <td></td> </tr> <tr> <td style="text-align: right;">20</td> <td style="border: 1px solid black; padding: 5px;">100</td> <td style="border: 1px solid black; padding: 5px;">8</td> <td></td> </tr> <tr> <td style="text-align: right;">4</td> <td style="border: 1px solid black; padding: 5px;">20</td> <td style="border: 1px solid black; padding: 5px;">1.6</td> <td></td> </tr> </table> <p style="text-align: center;">100 + 20 + 8 + 1.6 = 129.6</p>		5	4	0		1	1 0	8	0	2	2	2 0	1 6	0	4		9	6	0			500	40	0		20	10000	800	0		4	2000	160	0			5	0.4		20	100	8		4	20	1.6		129.6(0)	3	<p>M1 for a complete method with relative place value correct. Condone 1 multiplication error, addition not necessary.</p> <p>OR</p> <p>M1 for a complete grid. Condone 1 multiplication error, addition not necessary.</p> <p>OR</p> <p>M1 for sight of a complete partitioning method, condone 1 multiplication error. Final addition not necessary.</p> <p>A2 for 129.6(0)(p) cao (A1 f.t. (dep on M1) for correct placement of decimal point or for digits 1296(0) seen</p> <p>SC B1 for addition of 24 lots of 5.4(0) or 540 oe</p>
	5	4	0																																																
1	1 0	8	0	2																																															
2	2 0	1 6	0	4																																															
	9	6	0																																																
	500	40	0																																																
20	10000	800	0																																																
4	2000	160	0																																																
	5	0.4																																																	
20	100	8																																																	
4	20	1.6																																																	

5544F/12F					
Question		Working	Answer	Mark	Notes
13	(a)		129 – 133	1	B1 for 129 – 133
	(b)	6×50	290 – 310	2	B2 for 290 – 310 (B1 for 6 ± 0.2 (cm) seen or for $d \times 50$ with $3 \leq d \leq 9$)
	(c)		Point C marked	2	B1 for $BC = 7 \pm 0.2$ cm B1 for bearing = $60 \pm 2^\circ$
14	(a)	$\frac{4}{12} + \frac{1}{12}$	$\frac{5}{12}$	2	M1 for $\frac{4}{12}$ or attempting to use a suitable common denominator other than 12, at least one of two fractions correct. A1 for $\frac{5}{12}$ oe OR Attempt to use decimals, must be at least 2 dp M1 for 0.33 (33...) + 0.08 (33....) A1 for 0.416 recurring
	(b)		$\frac{3}{20}$	1	B1 for $\frac{3}{20}$ oe
15	(a)		t^3	1	B1 for t^3 (Accept t^{1+2} oe)
	(b)		m^2	1	B1 for m^2 (Accept m^{5-3} oe)

5544F/12F					
Question	Working	Answer	Mark	Notes	
16	(a)	3	1	B1 for 3 cao	
	(b)	4	1	B1 for 4 cao	
	(c)	-3	2	M1 for $2q + 7 - 7 = 1 - 7$ oe or -7 on both sides or -6 seen A1 for -3 oe (Accept $\frac{-6}{2}$ oe)	
	(d)	5	2	M1 for $5t - 3t = 6 + 4$ or $-4 - 6 = 3t - 5t$ oe A1 for 5 cao	
17		Correct construction	2	M1 for constructing intersecting arcs of equal radius from each of the ends of the given line A1 for a correct triangle with appropriate arcs SC: B1 for a correct triangle drawn within guidelines if M0 scored NB: Guidelines allow for 2 mm tolerances	
18		-2, -1, 0, 1, 2	2	B2 for -2, -1, 0, 1, 2 cao (B1 for 4 correct only or B1 for 4 correct and 1 incorrect or B1 for 5 correct and 1 incorrect)	

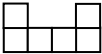
5544F/12F				
Question	Working	Answer	Mark	Notes
19	(a)	Triangle A		
		Triangle with vertices (-1,5), (-1,3), (3, 3)	2	B2 for triangle with vertices (-1, 5), (-1, 3), (3, 3) (B1 for triangle with correct orientation or triangle rotated $\pm 90^\circ$ centre (-1, 1))
	(b)	Triangle B		
		Triangle with vertices (1,-2), (5,-2), (5, -4)	1	B1 for triangle with vertices (1, -2), (5, -2), (5, -4)
	(c)	Triangle C		
		Triangle with vertices (1, 1.5), (1, 4), (2, 4),	2	B2 for triangle with vertices (1, 1.5), (1, 4), (2, 4) (B1 for the triangle with correct orientation or for any two of the vertices (1, 1.5), (1, 4), (2, 4) SC: B1 for a triangle with vertices (1, 1.5), (1, k), (2, k)

5544F/13F				
Question	Working	Answer	Mark	Notes
1 (a)(i) (ii) (b)		F B C and E	2 1	B1 B1 B1 for both
2 (a) (b) (c)		9 8 -1		B1 (accept Cape Town) B1 (accept -8) B1 cao
3	$29 - 16 = 13$	13/29	2	M1 for $\frac{x}{29}$ or 29 - 16 or 13 seen A1 for 13/29
4	$33.20 \div 40 = 0.83$ $\begin{array}{r} 83 \\ 40 \overline{)3320} \\ \underline{320} \\ 120 \end{array}$	83p or £0.83	3	M1 for $33.20 \div 40$ or $3320 \div 40$ or a valid partitioning method A1 for sight of the digits 83 B1 ft for "cost of 1 litre" correctly written as money SC B1 for sight of £1.20
5	$200 \div 5 \times 3$	120	2	M1 for $200 \div 5 (= 40)$ or $200 \times 3 (= 600)$ or 200×0.6 A1 cao
6	$8:57 - 8:11 = 46$ $46 \times 12 = 552$	5.52	4	M1 for 8:57 - 8:11 or 57 - 11 or 46 seen or evidence of counting on from 8:11 to 8:57 accept 8:11 - 8:57 M1 for "46" $\times 12$ A1 cao for digits 552 B1 ft for "5.52"

5544F/13F				
Question	Working	Answer	Mark	Notes
7 (a) (b) (c)		4 19 10	1 1 1	B1 cao B1 cao B1 cao
8 (a) (b)		123 – 127 35 – 36	1 1	B1 for 123 – 127 inclusive B1 for 35 – 36 inclusive
9		cylinder, pyramid, cuboid, triangular prism	3	B3 for all 4 correct (B2 for 2 or 3 correct) (B1 for 1 correct)
10 (a) (b)	$30 + (7 \times 4)$ $51 - 30 = 21$ $21 \div 7 = 3$	58 3	2 3	M1 for $30 + 7 \times 4$ or $30 + 28$ A1 cao M1 for $51 - 30$ or sight of 21 M1 (dep) for “21” $\div 7$ A1 cao
11	$180 - 23 - 23$	134	2	M1 for $180 - 23 - 23$ or $180 - 46$ or $180 - 2 \times 23$ oe A1 cao

5544F/13F				
Question	Working	Answer	Mark	Notes
12	42 out of 50 = 84 % 48 out of 60 = 80 %	history + calculations	4	<p>M1 for correct method of making one mark a percentage, decimal A1 for 84 % or 80 % or 0.84 or 0.8 oe</p> <p>M1 for correct method of making both marks into percentages or decimals e.g. 84 % and 80 % or 0.84 and 0.80 o.e. A1 (dep on M2 A1 and both percentages or decimals correct) for history (accept 42 out of 50 or 42/50 or 84% or 0.84 oe)</p> <p>Alternative method 1 (equivalent fractions)</p> <p>M1 for correct method to identify a denominator that is the same for history and geography A1 for writing one of the marks as a correct fraction of their denominator M1 for correct method of making both marks into fractions with the same denominator A1 (dep on M2 A1 and both equivalent fractions correct) for history (accept 42 out of 50 or 42/50)</p> <p>Alternative method 2 (complement method)</p> <p>M1 for identifying both 8 and 12 as marks not gained A1 for 16% or 20% or 0.16 or 0.20 o.e. M1 for correct method of making both marks into percentages or decimals e.g. 16% and 80% and 0.16 and 0.2 A1 (dep on M2 A1 and both percentages or decimals) for history (accept 42 out of 50 or 42/50 16%)</p>

5544F/13F				
Question	Working	Answer	Mark	Notes
13 (a)		$P = 3n$	2	B2 for $P = 3n$ oe (B1 for $P = kn$ oe) or $3n$ (oe) seen
(b)		18	2	Note $n + 3$; $P + n + n + n$ oe gets B0 M1 for correct substitution in their formula A1 cao
14 (a)		5	1	B1
(b)		enlargement	2	B2 for correct enlargement (B1 for any 3 sides correctly enlarged or for any correct enlargement by a different scale factor $\neq 1$) allow tolerance of $\pm \frac{1}{2}$ square
15 (a)	$(2.40 \times 10) + (4.50 \times 5)$ $= 24.00 + 22.50 = 46.50$ $50.00 - 46.50$	3.50	3	M1 for (2.40×10) or (4.50×5) or sight of 24 or 22.5(0) M1 for $2.40 \times 10 + 4.50 \times 5$ or sight of $24 + 22.5(0)$ or sight of 46.5(0) A1 cao (accept 3.5)
(b)	125×2	250	2	M1 for 125×2 A1 cao
(c)	$648 \div 2$	324	2	M1 for $648 \div 2$ A1 cao
16	84 : 16 or 42 : 8	21 : 4	2	M1 for 84 : 16 or 42 : 8 or 4 : 21 or 8 : 42 or 16 : 84 or 5.25 : 1 or 1 : 0.19... or any multiple of 84 : 16 (e.g. 8.4 : 1.6, 10.5 : 2) for M1 ignore % signs A1 cao

5544F/13F				
Question	Working	Answer	Mark	Notes
17			2	B2 ignore orientation (B1 for 1 square incorrect or missing or extra or an enlargement of the elevation)
18	$7x - 19 = 3x - 9$ $7x - 3x = -9 + 19$ $4x = 10$	2.5	3	M1 for expansion of brackets: $3x - 9$ M1 for rearrangement of their two terms e.g. $7x - 3x = -9 + 19$ or an indication how this might be done for both variable and numbers A1 for $2.5, \frac{5}{2}, \frac{10}{4}$ o.e.
19	$8^2 + 7^2$ $64 + 49 = 113$ $\sqrt{113} = 10.630145$	10.63	3	M1 for $8^2 + 7^2$ or $64 + 49$ or 113 M1 for $\sqrt{("64+49")}$ or $\sqrt{"113"}$ where it is clear that the 8 and 7 have been squared A1 for 10.63 to 10.631 inclusive SC B1 for an answer of 10.6 with no working, with or without a scale drawing

GCSE MATHEMATICS – JUNE 2008
5544H/14H - MARK SCHEME
FINAL VERSION

5544H/14H					
Question	Working	Answer	Mark	Notes	
1	(a)	$\frac{24}{8} \times 300$	900	2	M1 for $\frac{24}{8}$ oe or $300 + 300 + 300$ or $300 \div 8$ or 37.5 seen A1 for 900 cao [SC: B1 for sight of 2 of 3, 360, 15 if M0 scored]
	(b)	$\frac{12}{8} \times 120$	180	2	M1 for use of $\frac{12}{8}$ or 1.5 oe for example $120 + \frac{120}{2}$ or "120 ÷ 8" × 12 A1 for 180 cao [SC: B1 for sight of 2 of 450, 1.5, 7.5 if M0 scored]

GCSE MATHEMATICS – JUNE 2008
5544H/14H - MARK SCHEME
FINAL VERSION

Question	Working	Answer	Mark	Notes																																					
2	$\begin{array}{r} 54 \\ \underline{24} \\ 216 \\ \underline{1080} \\ 1296 \end{array}$ <p style="text-align: center;">OR</p> $\begin{array}{r} 24 \\ \underline{54} \\ 96 \\ \underline{1200} \\ 1296 \end{array}$ <table style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td></td> <td style="text-align: center;">5</td> <td style="text-align: center;">4</td> <td></td> </tr> <tr> <td style="text-align: center;">1</td> <td style="border: 1px solid black; padding: 2px;">1</td> <td style="border: 1px solid black; padding: 2px;">0</td> <td style="text-align: center;">2</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="border: 1px solid black; padding: 2px;">2</td> <td style="border: 1px solid black; padding: 2px;">1</td> <td style="text-align: center;">4</td> </tr> <tr> <td></td> <td style="text-align: center;">9</td> <td style="text-align: center;">6</td> <td style="text-align: center;">0</td> </tr> </table> <table style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td></td> <td style="text-align: center;">50</td> <td style="text-align: center;">4</td> </tr> <tr> <td style="text-align: center;">20</td> <td style="border: 1px solid black; padding: 2px;">1000</td> <td style="border: 1px solid black; padding: 2px;">80</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="border: 1px solid black; padding: 2px;">200</td> <td style="border: 1px solid black; padding: 2px;">16</td> </tr> </table> <p style="text-align: center;">1000 + 200 + 80 + 16 = 1296</p> <table style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td></td> <td style="text-align: center;">5</td> <td style="text-align: center;">0.4</td> <td></td> </tr> <tr> <td></td> <td style="border: 1px solid black; padding: 2px;">1</td> <td style="border: 1px solid black; padding: 2px;">0.08</td> <td style="text-align: center;">0.2</td> </tr> <tr> <td></td> <td style="border: 1px solid black; padding: 2px;">0.2</td> <td style="border: 1px solid black; padding: 2px;">0.016</td> <td style="text-align: center;">0.04</td> </tr> </table> <p style="text-align: center;">1 + 0.2 + 0.08 + 0.016 = 1.296</p>		5	4		1	1	0	2	2	2	1	4		9	6	0		50	4	20	1000	80	4	200	16		5	0.4			1	0.08	0.2		0.2	0.016	0.04	1.296	3	<p>M1 for a complete method with relative place value correct. Condone 1 multiplication error, addition not necessary.</p> <p>OR</p> <p>M1 for a complete grid. Condone 1 multiplication error, addition not necessary.</p> <p>OR</p> <p>M1 for sight of a complete partitioning method, condone 1 multiplication error. Final addition not necessary.</p> <p>A1 for sight of digits 1296(00...)</p> <p>A1 (dep on M1, but not previous A1) for correct placement of decimal point in their product.</p> <p>[SC: B2 for digits 1296(00...) seen if M0 scored]</p>
	5	4																																							
1	1	0	2																																						
2	2	1	4																																						
	9	6	0																																						
	50	4																																							
20	1000	80																																							
4	200	16																																							
	5	0.4																																							
	1	0.08	0.2																																						
	0.2	0.016	0.04																																						

GCSE MATHEMATICS – JUNE 2008
5544H/14H - MARK SCHEME
FINAL VERSION

5544H/14H					
Question	Working	Answer	Mark	Notes	
3	(a)	$2q + 7 - 7 = 1 - 7 = -6$	-3	2	M1 for $2q + 7 - 7 = 1 - 7$ oe, subtracting 7 from both sides or -6 seen. A1 for -3 (Accept $\frac{-6}{2}$ oe, but $-6 \div 2$ is NOT enough)
	(b)	$5t - 3t = 6 + 4$	5	2	M1 for $5t - 3t = 6 + 4$ or $-4 - 6 = 3t - 5t$ oe A1 for 5 cao
4	(a)		90	1	B1 cao
	(b)	$(120 - 50) \div 10$	7	2	M1 for $120 - 50$ or 70 seen A1 for 7 cao
	(c)		$C = 10n + 50$	2	B2 for $C = 10n + 50$ (ignore £C or C pounds) [$10n$ may be written $10 \times n$, $n \times 10$ etc. Accept, for example, $C = 10d + 50$] [(B1 for $10n + a$ or $bn + 50$ (ignore £C or C pounds) or $C =$ a linear expression in n other than $C = n$ or $n = \frac{C - 50}{10}$ or $n = 10n + 50$]
5	(a)		d^4	1	B1 for d^4 cao
	(b)		t^3	1	B1 for t^3 (accept $1t^3$ or t^{1+2} oe)
	(c)		m^2	1	B1 for m^2 (accept $1m^2$ or m^{5-3} oe)
6			Correct construction	2	M1 for constructing intersecting arcs, of equal radius, from each of the ends of the given line A1 for a correct triangle with appropriate arcs. [SC: B1 for a correct triangle drawn within guidelines if M0 scored] [NB: guidelines allow for a 2 mm tolerance]

GCSE MATHEMATICS – JUNE 2008
5544H/14H - MARK SCHEME
FINAL VERSION

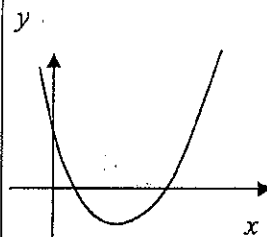
5544H/14H					
Question	Working	Answer	Mark	Notes	
7		-2, -1, 0, 1, 2	2	B2 for -2, -1, 0, 1, 2 cao (B1 for 4 correct only or 4 correct and one incorrect or 5 correct and one incorrect)	
8	(a) $(2-1) + \left(\frac{4}{5} - \frac{3}{4}\right) = 1 + \left(\frac{16}{20} - \frac{15}{20}\right)$ or $\frac{14}{5} - \frac{7}{4} = \frac{56}{20} - \frac{35}{20} = \frac{21}{20}$ or 2.8 - 1.75	$1\frac{1}{20}$	3	M1 for attempt to convert to fractions with common denominator, e.g. two fractions with denominator 20 A1 correct conversion: $\frac{16}{20}$ and $\frac{15}{20}$ oe, or $\frac{56}{20}$ or $\frac{35}{20}$ oe A1 for $\frac{21}{20}$ or $1\frac{1}{20}$ OR M1 for 0.8 - 0.75 (or 2.8 - 1.75) A2 for 1.05 (A1 for 0.05)	
	(b)	Reason	1	B1 for '1/3 = 0.3 recurring (accept 0.33)' or '0.3 = 3/10'	
9	(a) Triangle A	Triangle with vertices (-1,5), (-1,3), (3, 3)	2	B2 for triangle with vertices (-1, 5), (-1, 3), (3, 3) [B1 for triangle with correct orientation or a triangle rotated $\pm 90^\circ$, centre (-1, 1)]	
	(b) Triangle B	Triangle with vertices (1,-2), (5,-2), (5, -4)	1	B1 for triangle with vertices (1, -2), (5, -2), (5, -4)	
	(c) Triangle C	Triangle with vertices (1, 1.5), (2,4), (1, 4)	2	B2 for triangle with vertices (1, 1.5), (2, 4), (1, 4) [B1 for triangle with correct orientation or for any two of the vertices (1, 1.5), (2, 4), (1, 4)] [SC: B1 for a triangle with the vertices ((1, 1.5), (2,k), (1, k)]	

GCSE MATHEMATICS – JUNE 2008
5544H/14H - MARK SCHEME
FINAL VERSION

5544H/14H					
Question	Working	Answer	Mark	Notes	
10	(a)(i) 2×70 (ii) (b)(i) $180 - 70$ or $\frac{1}{2} \times 220$ (ii)	140 Reason 110 Reason	2 2	B1 for 140 cao B1 for 'angle at centre is twice angle at circumference' B1 for 110 cao B1 for 'opposite angles in a cyclic quadrilateral sum to 180 degrees' or 'angle at centre is twice angle at circumference'	
11	e.g. adding equations leads to $3x = 9$ substitute $x = 3$ into eqn(1) leads to $3y = -6$ <u>OR</u> $x = 9 + 3y$ $2(9 + 3y) + 3y = 0$ $9y = -18$	$x = 3$ $y = -2$	3	M1 for adding equations or for coefficients of x the same followed by subtracting the equations, condone one arithmetical error M1 (dep) for substituting found value in one equation A1 cao (SC: B1 for one correct answer only if Ms not awarded) <u>OR</u> M1 for $2(9 + 3y) + 3y = 0$, condone one arithmetical error M1 (dep) for substituting found value in one equation A1 cao (SC: B1 for one correct answer only if Ms not awarded)	

GCSE MATHEMATICS – JUNE 2008
5544H/14H - MARK SCHEME
FINAL VERSION

5544H/14H					
Question	Working	Answer	Mark	Notes	
12	$2t - 10 = y$ $2t = y + 10$ OR $t - 5 = \frac{y}{2}$ $t = \frac{y}{2} + 5$	$t = \frac{y+10}{2}$ oe	3	M1 for expanding bracket $2t - 10$ M1 (indep) for adding k to both sides, where $2t - k = y$ has been seen A1 for $t = \frac{y+10}{2}$ [Note: $t = \frac{y+5}{2}$ with no working gets M0M0A0] OR M1 for dividing both sides by 2 eg. $\frac{2(t-5)}{2} = \frac{y}{2}$ or $t - 5 = \frac{y}{2}$ M1 for +5 to both sides M1 (indep) for adding k to both sides, where $t - k = \frac{y}{2}$ has been seen A1 for $t = \frac{y}{2} + 5$ oe	
13	(a) (b)	7, -2, 2	2 2	B2 for all three values correct (B1 for any one or two correct) B2 For a fully correct graph OR B1 ft for 7 points plotted correctly ± 2 mm B1 for smooth curve drawn through their points provided B1 awarded in (a).	



GCSE MATHEMATICS – JUNE 2008
5544H/14H - MARK SCHEME
FINAL VERSION

5544H/14H					
Question	Working	Answer	Mark	Notes	
14	(a)	$\frac{1}{9}$	1	B1 for $\frac{1}{9}$ (accept 0.1 recurring)	
	(b)	$\frac{7^6}{7^3}$	2	M1 for $\frac{7^{2+4}}{7^3} \left(\frac{7^6}{7^3}\right)$ or $\frac{7^4}{7^{3-2}} \left(\frac{7^4}{7}\right)$ or $\frac{7^2}{7^{3-4}} \left(\frac{7^2}{7^{-1}}\right)$ or $\frac{7 \times 7 \times 7 \times 7 \times 7 \times 7}{7 \times 7 \times 7}$	
	(c)	$5 + 3\sqrt{3}$	2	A1 for 7^3 (accept 343) M1 for $2 \times 1 + 2 \times \sqrt{3} + 1 \times \sqrt{3} + \sqrt{3} \times \sqrt{3}$ or for three of 2, $2\sqrt{3}$, $\sqrt{3}$, 3 ($\sqrt{9}$, $\sqrt{3^2}$, $(\sqrt{3})^2$) A1 for $5 + 3\sqrt{3}$ cao [SC: B1 for $a + 3\sqrt{3}$ or $5 + b\sqrt{3}$, where a and b are both integers and $\neq 0$, if M0 scored]	
15	(a)	0.5	2	B1 cao	
	(b)	120 or 240		B1 accept $120 \pm 360n$ or $240 \pm 360n$ (where n is an integer, in particular -120 and -240 are acceptable)	
16	(a)(i)	$\frac{1}{2}a$	2	B1 for $\frac{1}{2}a$ oe	
	(ii)	$\frac{1}{2}a - \frac{1}{2}c$		B1 for $\frac{1}{2}a - \frac{1}{2}c$ oe	
	(b)	$\overline{CA} = a - c$ $\overline{MN} = \frac{1}{2}(a - c)$	2	B1 for $\overline{CA} = a - c$ oe B1 (dep on first B1) for $\overline{MN} = \frac{1}{2}\overline{CA}$ oe or for ' \overline{CA} is a multiple of \overline{MN} ' (condone absence/misuse of vector notation)	

GCSE MATHEMATICS – JUNE 2008
5544H/14H - MARK SCHEME
FINAL VERSION

5544H/14H				
Question	Working	Answer	Mark	Notes
17	$\pi x^2(2x) = \frac{1}{3}\pi(x)^2 h$	$6x$	3	M1 for either $\pi x^2(2x) = \text{"volume of cylinder"}$ or $\frac{1}{3}\pi x^2 h = \text{"volume of cone"}$ A1 for $2\pi x = \frac{1}{3}\pi h$ or better OR $3\pi x^2 \times 2x = \pi x^2 h$ or better OR $x^2(2x) = \frac{1}{3}x^2 h$ or better A1 for $(h =) 6x$ (Accept $\frac{6x}{1}$)

5544H/15H				
Question	Working	Answer	Mark	Notes
1 (a) (b)		5 enlargement	1 2	B1 B2 for correct enlargement (B1 for any 3 sides correctly enlarged)
2 (a) (b)	$3 \times -4 + 5 \times 6$ $= -12 + 30$	12.7 18	1 2	B1 for 12.7 or $12\frac{7}{10}$ M1 for 3×-4 or -12 AND 5×6 or 30 seen A1 cao
3	$\frac{22.4 \times 14.5}{8.5 \times 3.2} = \frac{324.8}{27.2}$	11.94117647	2	M1 for 324.8 or 27.2 or $\frac{136}{5}$ or $\frac{1624}{5}$ A1 for 11.941(17647...). Accept $\frac{203}{17}$ or $11\frac{16}{17}$
4		Sketch	2	B2 for complete 3-D sketch (B1 for partial 3-D sketch eg pyramid or base only, or a shape with a box and 2 pyramids either end) NB : If more than one shape is shown : For 2 marks there should be no choice or alternatives other than those also worth 2 marks; if there are several diagrams of which at least one is worth 1 or 2 marks, award B1. 2D diagrams get B0

5544H/15H				
Question	Working	Answer	Mark	Notes
5	$2x - 6 = 5$ $2x = 5 + 6 = 11$	5.5	3	M1 for $2x - 6 (= 5)$, or $x - 3 = 5 \div 2$ M1 ft for $2x = 5 + "6"$ or $x = \frac{5}{2} + "3"$ or clear intention to add "6" or "3" to both sides of the equation A1 for 5.5 or $\frac{11}{2}$ oe
6	$2 \rightarrow 12$ $3 \rightarrow 33$ $2.5 \rightarrow 20.(625)$ $2.1 \rightarrow 13.(461)$ $2.6 \rightarrow 22.(776)$ $2.2 \rightarrow 15.(048)$ $2.7 \rightarrow 25.(083)$ or 25 $2.3 \rightarrow 16.(767)$ $2.8 \rightarrow 27.(552)$ $2.4 \rightarrow 18.(624)$ $2.9 \rightarrow 30.(189)$ $2.73 \rightarrow 25.8(06)$ $2.74 \rightarrow 26.0(508)$ or 26 $2.75 \rightarrow 26.2(96)$ $2.76 \rightarrow 26.5(44576)$	2.7	4	B2 for trial between 2.7 and 2.8 inclusive (B1 for trial between 2 and 3 inclusive) B1 for different trial between 2.73 and 2.75 inclusive B1 (dep on at least one previous B1) for 2.7 only NB Trials where x has 1 dp. should be evaluated to at least 2sf. truncated or rounded Trials where x has more than 1 dp. should be evaluated to at least 3 sf. truncated or rounded.

5544H/15H				
Question	Working	Answer	Mark	Notes
7	$\frac{91-85}{85} \times 100 = \frac{6}{85} \times 100 =$ $7.05882..$	7.06	3	<p>M2 for $\frac{91-85}{85} \times 100$ or $\frac{6}{85} \times 100$</p> <p>(M1 for $\frac{91-85}{85}$ or sight of $\frac{6}{85}$ or 0.0705 – 0.071</p> <p>or $\frac{91}{85}$ or 1.0705 – 1.071 oe)</p> <p>A1 7.05 - 7.06</p> <p>OR</p> <p>M1 for $\frac{91}{85} \times 100 (= 107.05...)$</p> <p>M1 for “107.05” – 100</p> <p>A1 7.05 - 7.06</p> <p>Trial and Improvement methods must lead to an answer 7.05 – 7.06 for full marks, otherwise 0 marks</p>

5544H/15H				
Question	Working	Answer	Mark	Notes
8 (a)	$2x+2x+x+10+50=360$	$5x+60 = 360$	2	M1 for any 3 or 4 of $2x$, $2x$, $x + 10$, 50 added together A1 for $2x+2x+x+10+50 = 360$ oe including $x = 60$
(b)	$5x+60=360$ $5x=300$	60	3	M1 for isolating their terms in x M1 for dividing their numerical term by the coefficient of their x term A1 cao All the marks in (b) may be given for work done in answering (a) providing there is no contradiction Candidates can score full marks in (b) independent of their answer to (a) (eg by starting again)

5544H/15H				
Question	Working	Answer	Mark	Notes
9 (a)	$45 \times 2 \div 9$	10	2	M1 for $45 \div "2 + 7"$ or 45×2 or 5 seen or 90 seen or 10 seen or as part of a ratio (eg. 10 : 35) A1 cao
(b)	$(80 \times 17.5/100) + 80 = 14 + 80 =$	94	3	M2 for 80×1.175 or $80 \times \frac{117.5}{100}$ oe A1 cao OR M1 for $80 \times \frac{17.5}{100}$ or 80×0.175 or 14 seen or 8+4+2 seen M1 (dep) for $80 + "14"$ or $80 + 80 \times \frac{17.5}{100}$ oe
(c)	12000×0.8^2 OR 1 st yr: $12000 \times 0.2 = 2400$; $12000 - 2400 = 9600$ 2 nd yr: $9600 \times 0.2 = 1920$; $9600 - 1920 = 7680$ [3 rd year is 6144; 4 th yr is 4915.20]	7680	3	A1 cao M1 for 12000×0.8 or sight of 9600 or 2400 or 4800 or 7200 seen M1 (dep) "9600" $\times 0.8$ oe A1 cao OR M2 for 12000×0.8^2 or 12000×0.8^3 A1 cao (if correct answer seen ignore subsequent years)

5544H/15H				
Question	Working	Answer	Mark	Notes
10	$\pi \times 4^2 \times 10 = 502.65$ (502-503)	503	2	M1 for $\pi \times 4^2 \times 10$ (=502.65) A1 for 502-503 SC: B1 for $\pi \times 8^2 \times 10$
11 (a)	$8^2 + 7^2$ $64 + 49 = 113$ $\sqrt{113} = 10.630145$	10.63	3	M1 for $8^2 + 7^2$ or $64+49$ or 113 or $8^2 + 7^2 - 2 \times 8 \times 7 \times \cos 90$ M1 for $\sqrt{\text{''}(64+49)\text{'}}$ or $\sqrt{\text{'113}}$ where it is clear that the 8 and 7 have been squared A1 for any answer in 10.63 – 10.631 inclusive SC : B1 for 10.6 with no working with or without a scale drawing
(b)	$\tan y = 32/46 = 0.6956$ $\tan^{-1} 0.6956 = 34.82^\circ$	34.8	3	M1 for $\tan (y =) \frac{32}{46}$ M1 for $\tan^{-1} 0.6956$ or $\tan^{-1} \left(\frac{32}{46} \right)$ oe (including shift tan or inv tan for \tan^{-1}) A1 for 34.79 – 34.85 OR M1 for $\sqrt{(32^2 + 46^2)}$ (= 56.03(5...)) and $\frac{\sin 90}{56.(0\dots)} = \frac{\sin y}{32}$ oe M1 ($y =$) $\sin^{-1} \frac{(\sin 90) \times 32}{56.(0\dots)}$ (= $\sin^{-1}(0.5710(6\dots))$) A1 34.79 – 34.85 SC: B2 for (radians) 0.607(8...) or (gradians) 38.6(93...) Alternative methods using Pythagoras and then sin or cos must have a fully correct method for Pythagoras and sin or cos before they score the first M1. The trigonometry could be sohcahtoa or Sine rule or Cosine rule

5544H/15H				
Question	Working	Answer	Mark	Notes
12	<p>B at $(-2, -1), (-4, -1), (-2, -4)$</p> <p>C at $(4, -1), (6, -1), (4, -4)$</p>	<p>Rotation 180° about $(1,0)$</p>	3	<p>B1 for rotation B1 for 180° or half a turn B1 (for centre)$(1,0)$ OR B1 for enlargement B1 for scale factor -1 accept -1 on its own if ti is clear candidate is describing an enlargement B1 for centre $(1,0)$</p> <p>Ignore diagram unless no marks scored in which case SC: B1 for showing both B and C correctly</p> <p>NB: Award no marks if more than one transformation given.</p>
13		$5c^2$ $ab+bc$	2	<p>B2 for both correct, no extras (B1 for 1 correct out of 1 or 2 answers) NB: If more than 3 crosses, deduct 1 mark for each extra to a minimum of zero.</p>
14	$\frac{150}{360} \times \pi \times 13^2 = 221.22\dots$	221	2	<p>M1 for $\frac{150}{360} \times \pi \times 13^2$ or $\pi \times 13^2 \div 2.4$ oe or A1 220 – 222</p>

5544H/15H				
Question	Working	Answer	Mark	Notes
15	238 has a max of 238.5, a min of 237.5 27.3 has a max of 27.35, a min of 27.25 Upper: $\frac{238.5}{27.25} = 8.75229$	8.75	3	B1 for any one of 238.5, 237.5, 27.35, 27.25, 238.4 $\dot{9}$, 27.34 $\dot{9}$ seen M1 for “UB no. of miles” \div “LB no. of litres” where $238 < \text{UB of miles} \leq 238.5$ and $27.25 \leq \text{LB of litres} < 27.3$ A1 for 8.75 or 8.752 or 8.7522 or 8.7523 or better SC : $\frac{238.4}{27.25}$ which leads to 8.748.. B1 M1 A0
16	$\frac{10x+5}{3} = 4x+7$ $10x+5 = 12x+21$ $-16 = 2x$	-8	3	M1 for $10x+5$ or $12x+21$; either of these could be seen anywhere in the candidates working M1 (dep) for $10x - 12x = 21 - 5$ oe or $5 - 21 = 12x - 10x$ oe A1 cao

5544H/15H				
Question	Working	Answer	Mark	Notes
17	$a = 3, b = 7, c = -13$ $x = \frac{-7 \pm \sqrt{7^2 - 4 \times 3 - 13}}{2 \times 3}$ $= \frac{-7 \pm \sqrt{(49+156)}}{6} = \frac{-7 \pm \sqrt{205}}{6}$ $x = 1.2196\dots \text{ or } -3.55297\dots$ OR $x^2 + \frac{7}{3}x - \frac{13}{3} = 0$ $\left(x + \frac{7}{6}\right)^2 - \frac{49}{36} - \frac{13}{3} = 0$ $\left(x + \frac{7}{6}\right)^2 = \frac{205}{36}$ $x = -\frac{7}{6} \pm \sqrt{\frac{205}{36}}$	1.22 -3.55	3	M1 for correct substitution in formula of 3, 7 and ± 13 M1 for reduction to $\frac{(-7 \pm \sqrt{205})}{6}$ A1 1.215 to 1.22 and -3.55 to -3.555 OR M1 for $\left(x + \frac{7}{6}\right)^2$ M1 for $-\frac{7}{6} \pm \sqrt{\frac{205}{36}}$ A1 1.215 to 1.22 and -3.55 to -3.555 SC : Trial and Improvement : 1 mark for 1 correct root, 3 marks for both correct roots
18	$7 = ka^1 \quad 175 = ka^3$ $k = \frac{7}{a}, \quad 175 = \frac{7a^3}{a} = 7a^2$ $a^2 = 25, \quad \text{so } a = 5$ $k = \frac{7}{a}, \quad \text{so } k = \frac{7}{5} = 1.4$	$a = 5$ $k = 1.4$	3	M1 for $7 = ka$ or $7 = ka^1$ and $175 = ka^3$ A1 for $a = 5$ A1 for $k = 1.4$ oe SC : Either $a=5$ or $k=1.4$ oe with no working gets B2