

# Mock paper mark schemes

GCSE

Edexcel GCSE in Mathematics

Linear 2540, Modular 2544

Linear 1380, Modular 2381

January 2008

Edexcel, a Pearson company, is the UK's largest awarding body offering academic and vocational qualifications and testing to more than 25,000 schools, colleges, employers and other places of learning here and in over 100 countries worldwide. Our qualifications include GCSE, AS and A Level, GNVQ, NVQ and the BTEC suite of vocational qualifications from entry level to BTEC Higher National Diplomas and Foundation Degrees.

We deliver 9.4 million exam scripts each year, with over 3.8 million marked onscreen in 2006. As part of Pearson, Edexcel has been able to invest in cutting-edge technology that has revolutionised the examinations system, this includes the ability to provide detailed performance data to teachers.

#### *Acknowledgements*

This document has been produced by Edexcel on the basis of consultation with teachers, examiners, consultants and other interested parties. Edexcel recognises and values all those who contributed their time and expertise to the development of GCSE specifications.

*References to third party material made in this specification are made in good faith. Edexcel does not endorse, approve or accept responsibility for the content of materials, which may be subject to change, or any opinions expressed therein. (Material may include textbooks, journals, magazines and other publications and websites.)*

Authorised by Roger Beard

Prepared by Ali Melville

Publications code UG019581

All the material in this publication is copyright

© Edexcel Limited 2008

# Contents

---

<b>GCSE Mathematics 2540 and 1380 (Linear) mock papers</b>	<b>1</b>
Paper 1 (Foundation) mark scheme	3
Paper 2 (Foundation) mark scheme	11
<b>GCSE Mathematics 2540 (Linear) mock papers</b>	<b>17</b>
Paper 3 (Higher) mark scheme	19
Paper 4 (Higher) mark scheme	29
<b>GCSE Mathematics 2544 (Modular) mock papers</b>	<b>37</b>
Unit 4 (Foundation) mark scheme	39
Unit 4 (Higher) mark scheme	45
<b>GCSE Mathematics 1380 (Linear) mock papers</b>	<b>53</b>
Paper 3 (Higher) mark scheme	55
Paper 4 (Higher) mark scheme	65
<b>GCSE Mathematics 2381 (Modular) mock papers</b>	<b>73</b>
<b>Unit 2 Stage 1 mock papers</b>	<b>75</b>
Unit 2 Stage 1 mark scheme	76
<b>Unit 2 Stage 2 mock papers</b>	<b>77</b>
Unit 2 Stage 2 (Foundation) mark scheme	79
Unit 2 Stage 2 (Higher) mark scheme	81
<b>Unit 3 mock papers</b>	<b>83</b>
Unit 3 (Foundation) mark scheme	85
Unit 3 (Higher) mark scheme	91
<b>Notes on marking principles</b>	<b>99</b>



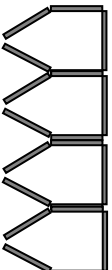
# **GCSE Mathematics mock papers**

## **2540 and 1380 (Linear)**



## GCSE Mathematics 2540 and 1380 Paper 1 (Foundation) mark scheme

Number	Working	Answer	Mark	Notes
1(a)		6578	1	B1 cao
(b)		Five thousand three hundred and seven	1	B1 accept 5 thousand 3 hundred and seven (condone 0 tens)
(c)		5840	1	B1 cao
(d)		600	1	B1 accept 600 or 6 hundred or 100 or hundred
2(a)		£3.70	1	B1 cao
(b)		£2.04	1	B1 cao
3(a)	Dolphin IIII 5 Elephant IIII 4 Lion III 3 Parrot II 2 Tiger IIII 1 6	Table	3	M1 for attempt to tally or one frequency correct in either column A1 for 1 frequency correct or all tallies correct in correct column A1 for all frequencies correct (accept if /20)
(b)		Tiger	1	B1 cao
4(a)			1	B1 cao
(b)			1	B1 cao
(c)			1	B1 cao
	9, 24, 37, 84, 127 -6, -3, -1, 1, 4 0.009, 0.0995, 0.12, 0.975, 0.99			

Number	Working	Answer	Mark	Notes
5(a)		18	2	B2 for 18 (B1 for 17 or 19)
(b)		12	1	B1 cao
(c)		14	1	B1 cao
6(i)		22	1	B1 cao
(ii)		10	1	B1 cao
(iii)		8	1	B1 cao
7(a)		Pattern	1	B1 cao
(b) i		21	1	B1 cao
ii		41	1	B1 cao
(c)		$4n + 1$	2	B2 for $4n + 1$ (B1 for an expression in $4n \pm p$ ( $p > 0$ ))
8	$4 \times 100$	400	2	M1 for 4 or 100 used A1 for 390 or 400
9(a)		7.6 cm	2	B2 for 7.6 cm $\pm 0.2$ cm or 76 mm $\pm 2$ mm (B1 for appropriate unit cm or mm)
(b)		128	1	B1 $\pm 2^\circ$
(c)		radius	1	B1 for line from centre to circumference

Number	Working	Answer	Mark	Notes
10(a)		<i>A</i> and <i>D</i>	2	B2 for both correct (B1 for 1 correct)
(b)		<i>B</i> and <i>C</i>	2	B2 for both correct (B1 for 1 correct)
11(a)		0	1	B1 for cross on or very near 0 (within 1 cm)
(b)		1	1	B1 for cross on or near 1 (within 1 cm)
(c)		$\frac{1}{2}$	1	B1 for cross on or near $\frac{1}{2}$ (within $\pm 1$ cm)
(d)		$\frac{1}{3}$	1	B1 for cross on or near $\frac{1}{3}$ (within $\pm 1$ cm)
12(a)		3.5	1	B1 for 3.5 or $3\frac{1}{2}$ m
(b)		Explanation	1	B1 for changing 2700 m to 2.7 km or 2.5 km to 2500 m and explaining which is the larger or smaller appropriately.
13(a)		Synthetic polymers	1	B1 accept 32
(b)		0.1	1	B1 cao
(c)		0.03	1	B1 cao
(d)		$\frac{8}{25}$	2	B2 for 8/25 B1 for 32/100 oe
14		7	1	B1 cao
		13	1	B1 cao
		11	1	B1 cao

Number	Working	Answer	Mark	Notes												
15(a) (b)		$x - 4$ $25t$	1 1	B1 cao B1 cao												
16 i ii	$72 \div 8$	48 9	1 2	B1 cao M1 for $72 \div 8$ A1 for 9												
17(a) (b) (c) (d)	$x = 8 - 5$ $2y = 12$ $3g = 8 + 7$ $5k + 5 = 3k + 12$ $2k = 7$ $k = 7 \div 2$	3 6 5 3.5	1 1 2 3	B1 cao B1 cao M1 for $8+7$ oe A1 for 5 M1 for $5k + 5$ M1 for $2k = 7$ A1 cao												
18	$\begin{array}{r} 254 \\ \underline{43 \times} \\ 762 \\ 9160 \\ 10922 \end{array}$ <p>or</p> <table border="1"> <tr> <td><math>\times</math></td> <td>200</td> <td>50</td> <td>40</td> </tr> <tr> <td>40</td> <td>8000</td> <td>2000</td> <td>160</td> </tr> <tr> <td>3</td> <td>600</td> <td>1500</td> <td>12</td> </tr> </table>	$\times$	200	50	40	40	8000	2000	160	3	600	1500	12	10 922	3	B3 for 10 922 (B2 for fully correct method with two errors in either + or $\times$ ) (B1 for a correct multiplication structure condone 1 error in $\times$ )
$\times$	200	50	40													
40	8000	2000	160													
3	600	1500	12													

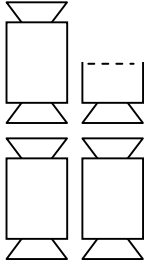
Number	Working	Answer	Mark	Notes
19	$80 \times \frac{15}{100} = 12$ $80 + 12 = 92$	£92	3	M1 $80 \times \frac{15}{100}$ A1 12 A1 92 <b>Or</b> M2 $80 \times \frac{115}{100}$ A1 92 <b>Or</b> M1 for attempt to find 10% and 5% of £80 A1 12 A1 92
20	$22$ $5 \quad 7$ $0 \quad 1$ $16$	Table	3	B3 for all 6 correct (B2 for 4 correct) (B1 for 2 correct)

Number	Working	Answer	Mark	Notes
21	$\frac{3}{10} + \frac{6}{10} = \frac{9}{10}$	$\frac{1}{10}$	4	M1 for writing $\frac{3}{5}$ as $\frac{6}{10}$ or using common denominator A1 for $\frac{9}{10}$ seen M1 for $1 - \frac{9}{10}$ A1 for $\frac{1}{10}$
22		20, 23	2	B1 for 20 B1 ft for “20” + 3
23(a)		Tessellation	2	B2 for fully correct with 5 or more additional shapes, no gaps (B1 for 4 shapes tessellating with at least 1 shape inverted, with or without existing shape, ignore extras)
(b)		Enlargement	2	B2 for fully correct (B1 for 1 length enlarged by scale factor 2)
24	$150 \div (10 \times 5)$	3	2	M1 for $150 \div “(10 \times 5)”$ A1 for 3
25(a)	$\frac{20 \times 30}{8 \times 5} = \frac{600}{40}$	15	2	B1 $\frac{20 \times 30}{8 \times 5}$ or $\frac{19 \times 30}{8 \times 5}$ or $\frac{20 \times 31}{8 \times 5}$ B1 14 - 16
(b)		15	1	B1 ft on (a)
26	$\frac{1}{2} + 1\frac{2}{3} = 3\frac{3}{6} + \frac{4}{6} = 3\frac{7}{6} = 4\frac{1}{6}$	$4\frac{1}{6}$	3	M1 for attempt to write the fractions over a common denominator A1 $\frac{3}{6} + \frac{4}{6}$ A1 cao

Number	Working	Answer	Mark	Notes
27(a) (b)		3 28	1 2	B1 cao M1 for using 16 <sup>th</sup> item or circling 8 in 20s row in diagram A1 for 28
28		(4, 2, 0)	2	B2 4,2 B1 0
29	$\frac{6 \times 8}{2} \times 20$	480	2	M1 for $\frac{6 \times 8}{2} \times 20$ A1 cao
30	$7 \times 12$	84	2	M1 $7 \times 12$ A1 cao
31	$x = 124 - 78$  Angles on straight line sum to 180 Corresponding angles Angles in a triangle sum to 180	46	2  1	M1 sight of 56 A1 46  B1 any 2 correct relevant statements



# GCSE Mathematics 2540 and 1380 Paper 2 (Foundation) mark scheme

Number	Working	Answer	Mark	Notes
1(a) (b) (c) (d)		43 1.8 Arrow Arrow	1 1 1 1	B1 cao B1 cao B1 cao for 2.40 marked correctly B1 cao for 3.2 marked correctly
2 i ii		Cylinder Cuboid	1 1	B1 ignore spelling as long as meaning is clear B1 ignore spelling as long as meaning is clear
3(a) (b)		5 Bars 28	1 1 2	B1 cao B1 for both bar heights correct M1 for attempt to add "8", "5", 6 and 9 A1 for 28
4(a) i ii (b)		60 50 Diagram	1 1 2	B1 for $60 \pm 2$ B1 for $50 \pm 2$ B2 for both correct B1 for 1 correct
5(a) i ii (b) i ii		(2, 4) (4, 0) Points	1 1 2	B1 cao B1 cao B1 for P marked correctly B1 for Q marked correctly

Number	Working	Answer	Mark	Notes
6 i ii iii		$5g$ $5fh$ $p^3$	1 1 1	B1 accept $5 \times g, g5$ B1 for $4fh$ accept $fh4$ or $4hf$ or $hf4$ B1 for $p^3$
7(a) (b) (c)		Line Point Circle	1 1 1	B1 for 8 cm line drawn B1 for $R$ marked 4 cm from $P \pm 2$ mm B1 for circle drawn within 2 mm tolerance
8	$2 \times \pounds 4.50 + \pounds 7.50$ $\pounds 20 - \pounds 16.50$	3.50	3	M1 for $2 \times \pounds 4.50$ or for $\pounds "9"$ + $\pounds 7.50$ M1 for $\pounds 20 - \pounds "16.50"$ A1 for $\pounds 3.50$
9	$4 \times 27$ $24 \div 3$ $1 \frac{1}{2}$	108 8 27 279	1 1 1 1	B1 cao B1 cao B1 cao B1 ft
10(a)i ii (b)		0.3 30%	1 1 1	B1 cao B1 cao B1 for 8 squares shaded
11(a) (b) (c)		74 London and Reading 193	1 1 3	B1 cao B1 cao M1 for 2 of 39, 57, 97 M1 for adding their 3 distances A1 cao

Number	Working	Answer	Mark	Notes
12(a)	$2 \times (3.5 + 5.6)$	18.2	2	M1 for adding 3.5 and 5.6 twice A1 cao
(b)	$3.5 \times 5.6$	19.6	2	M1 for multiplying lengths A1 cao
13		cm miles litres	1 1 1	B1 B1 B1
14(a)		Shape	1	B1 for correct reflection
(b)		Shade	1	B1 for correct square shaded
(c)		Shade	1	B1 for correct square shaded
15(a)		22	1	B1 cao
(b)		38	1	B1 cao
(c)		Explanation	1	B1 for 253 is odd, all the pattern members are even oe
16(a)		30	1	B1 cao
(b)		14	2	M1 for $10 + 20$ or $4 \times 4$ A1 for 14 cao
17(a)	$200 \times 1.45$	290	2	M1 for $200 \times 1.45$ A1 cao
(b)	$24.85 \div 1.42$	17.50	2	M1 for $24.85 \div 1.42$ A1 for 17.50

Number	Working	Answer	Mark	Notes
18(i)		5.0625	1	
(ii)		5	1	
(iii)		4	1	
19(a)		$\frac{13}{24}$	1	B1 cao
(b)		$\frac{15}{24}$	1	B1 oe
(c)		0	1	B1 cao
20(a)		$3r+2s$	2	B2 for $3r + 2s$ (B1 for $3r$ or $2s$ )
(b)	$13 = 2x + 5$ $13 - 5 = 2x$	4	2	M1 for $2x = 13 - 5$ A1 for 4
21		Triangle Triangle	2 2	M1 for a reflection in $x$ or $y$ axis A1 for correct triangle with coords $(-1, 1), (-1, 4), (-3, 1)$ M1 for a rotation of $90^\circ$ clockwise or anticlockwise A1 for correct triangle with coords $(1, -1), (4, -1), (1, -3)$
22		165	2	M1 for $55 \times 3$ A1 for 165
23	1 kg of apples costs £1.28 2 kg of lemons costs £5.76-( $3 \times$ £1.28)= £1.92	96p	3	B1 for £1.28 M1 for £5.76 - $3 \times$ "1.28" A1 cao

Number	Working	Answer	Mark	Notes
24	4.3% of £5000 = £215 $5000 + 215 \times 2$	£ 5430	3	M1 for 4.3% of £5000 = £215 M1 $5000 + 215 \times 2$ A1 cao
25(a)	$2(2x + 3y) + 2(x - 4y)$	$6x - 2y$	2	M1 $2(2x + 3y) + 2(x - 4y)$ A1 cao
(b)	$56 = 6x - 4$	10	2	M1 $56 = '6x - 4'$ A1 10 ft on (a)
26		$x^2$ $x^2 + 7x + 12$	1 2	A1 cao M1 for correct expansion A1 cao
27	$10^2 + 24^2 = 100 + 576$ $\sqrt{676}$ $26 + (2 \times 24) + (2 \times 10)$	94	4	M1 for $10^2 + 24^2$ or $100 + 576$ M1 for $\sqrt{676}$ A1 for 26 seen A1 cao

Number	Working	Answer.	Mark	Notes
28 (a)	$\pi \times 20$	62.8	2	M1 $\pi \times 20$ A1 62.8 - 62.84
(b)	$\frac{30 \times 100}{'62.8'} = 47.77$	48	2	M1 $\frac{30 \times 100}{'62.8'}$ or 30 m <sup>2</sup> '62.8 cm' A1 48
29(a)	$\frac{72}{360} \times 400$	80	2	M1 $\frac{72}{360} \times 400$ A1 cao
(b)	30% of 360 = 108	108	2	M1 30% of 360 A1 108°

# **GCSE Mathematics mock papers**

## **2540 (Linear)**



## GCSE Mathematics 2540 Paper 3 (Higher) mark scheme

Number	Working	Answer	Mark	Notes														
1(a)	$\frac{20 \times 30}{8 \times 5} = \frac{600}{40}$	15	2	B1 $\frac{20 \times 30}{8 \times 5}$ or $\frac{19 \times 30}{8 \times 5}$ or $\frac{20 \times 31}{8 \times 5}$ B1 14 - 16														
(b)		15	1	B1 ft on (a)														
2	$80 \times \frac{15}{100} = 12$ $80 + 12 = 92$	£92	3	M1 $80 \times \frac{15}{100}$ A1 12 A1 92 <b>Or</b> M2 $80 \times \frac{115}{100}$ A1 92 <b>Or</b> M1 for attempt to find 10% and 5% of £80 A1 12 A1 92														
3	<table border="1" style="display: inline-table; border-collapse: collapse; text-align: center;"> <tr> <td style="padding: 2px 5px;"><math>x</math></td> <td style="padding: 2px 5px;">-1</td> <td style="padding: 2px 5px;">0</td> <td style="padding: 2px 5px;">1</td> <td style="padding: 2px 5px;">2</td> <td style="padding: 2px 5px;">3</td> <td style="padding: 2px 5px;">4</td> </tr> <tr> <td style="padding: 2px 5px;"><math>y</math></td> <td style="padding: 2px 5px;">12</td> <td style="padding: 2px 5px;">10</td> <td style="padding: 2px 5px;">8</td> <td style="padding: 2px 5px;">6</td> <td style="padding: 2px 5px;">4</td> <td style="padding: 2px 5px;">2</td> </tr> </table>	$x$	-1	0	1	2	3	4	$y$	12	10	8	6	4	2		3	B1 for any correct (x,y) B1 any other correct (x,y) B1 correct line
$x$	-1	0	1	2	3	4												
$y$	12	10	8	6	4	2												

Number	Working	Answer	Mark	Notes
4	$x = 124 - 78$  Angles on straight line sum to 180  Corresponding angles Angles in a triangle sum to 180	46  Explanation	2  1	M1 sight of 56 A1 46  B1 any 2 correct relevant statements
5	Square $4 \times 4 = 16$ Trapezium $\frac{(4+8)}{2} \times (12-4) = 48$  <b>Or</b> Rectangle $4 \times 12 = 48$ Triangle $\frac{4 \times 8}{2} = 16$	64	4	M1 for $4 \times 4$ or 16 M1 for $\frac{(4+8)}{2} \times (12-4)$ or 48 M1 (dep on at least 1 previous M1) '16' + '48' A1 for 64  <b>Or</b> M1 $4 \times 12$ or 48 M1 $\frac{4 \times 8}{2}$ or 16 M1 (dep on at least 1 previous M1) '16' + '48' A1 for 64

Number	Working	Answer	Mark	Notes										
6	<table border="1"> <tr><td>4</td><td>3 6</td></tr> <tr><td>5</td><td>2 8</td></tr> <tr><td>6</td><td>2 3 5</td></tr> <tr><td>7</td><td>3 6 6 9 9</td></tr> <tr><td>8</td><td>1 2 4</td></tr> </table> <p>Key 8   4 represents 8.4 cm</p>	4	3 6	5	2 8	6	2 3 5	7	3 6 6 9 9	8	1 2 4	Diagram	3	B3 fully correct including key (B2 1 error or omission in table or key) (B1 2 errors or omissions in table or key) (B2 unordered, no errors otherwise, with key) (B1 unordered 1 or more errors, with key or unordered, no errors, with key)
4	3 6													
5	2 8													
6	2 3 5													
7	3 6 6 9 9													
8	1 2 4													
7	<p>Males 60% of 1500 = 900  Females 40% of 1500 = 600  Males like tennis 30% of 900 = 270  Females like tennis 40% of 600 = 240</p>	510	4	B1 for 900 B1 for 1500 – ‘900’ M1 for attempt to find 270 or 240 B1 cao										
8 (a)	$q^2 + 5q + 4q + 20$	$q^2 + 9q + 20$	2	M1 for sight of 3 or 4 out of 4 terms correct A1 cao										
(b)	$6k^2 - 9mk + 4km - 6m^2$	$6k^2 - 5mk - 6m^2$	2	M1 for sight of 3 out of 4 terms correct including signs or 4 out of 4 terms correct ignoring signs A1 cao										
9	$5x + 5 = 3x + 12$ $5x - 3x = 12 - 5$	3.5	3	B1 $5x + 5 = 3x + 12$ M1 correct process to isolate $2x$ or $-2x$ A1 cao										

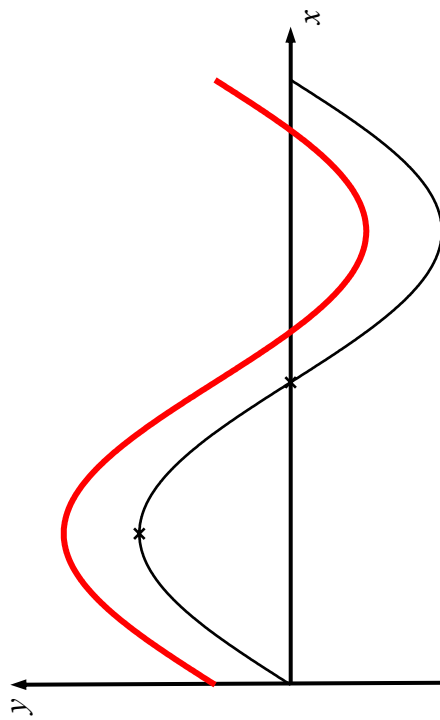
Number	Working	Answer	Mark	Notes
10 i	$4^{8-6}$	16	2	M1 for $4^{8-6}$ A1 cao
ii	$\frac{2^{10}}{2^{11}} = \frac{1}{2}$	$\frac{1}{2}$	2	M1 for $\frac{2^{10}}{2^{11}}$ A1 oe
11(a)	$7 \times 12$	84	2	M1 $7 \times 12$ A1 cao
(b)	$84 \div 8$	10.5	2	M1 '84' $\div 8$ A1 ft
12	$\frac{1}{2} + 1\frac{2}{3} = 3\frac{3}{6} + \frac{4}{6}$ $= 3\frac{7}{6} = 4\frac{1}{6}$	$4\frac{1}{6}$	3	M1 for attempt to write the fractions over a common denominator A1 $\frac{3}{6} + \frac{4}{6}$ A1 cao
13	$10 \times 30 + 30 \times 24 + 50 \times 40 + 6 \times 70$ $= 3440$ '3440' $\div 100$	34.4	4	M1 $\Sigma fx$ use of $x$ consistently in each interval (may include endpoints) M1 (dep) use of midpoints M1 (dep on 1 <sup>st</sup> M1) $\frac{\Sigma fx}{\Sigma f}$ A1 cao

Number	Working	Answer	Mark	Notes
14 (a)	$\frac{6 \times 8}{2} \times 20$	480	2	M1 for $\frac{6 \times 8}{2} \times 20$ A1 cao
(b)	'480' $\times 6$	2880	2	M1 '480' $\times 6$ A1 ft
15 (a)		$\frac{5}{8}$	2	B1 $\frac{5}{8}$ on the first branch
		$3\frac{5}{8}, \frac{5}{8}$		B1 $\frac{3}{8}, \frac{5}{8}$ respectively on each pair of the second branches
(b)	$\frac{5}{8} \times \frac{5}{8}$	$\frac{25}{64}$	2	M1 $\frac{5}{8} \times \frac{5}{8}$ A1 cao
(c)	$\frac{5}{8} \times \frac{3}{8} + \frac{5}{8} \times \frac{3}{8}$	$\frac{30}{64}$	3	M1 $\frac{5}{8} \times \frac{3}{8}$ M1 $\frac{5}{8} \times \frac{3}{8} + \frac{5}{8} \times \frac{3}{8}$ A1 cao
(d)	$\frac{3}{8} \times \frac{5}{7} + \frac{5}{8} \times \frac{4}{7} = \frac{35}{56}$	$\frac{5}{8}$	2	M1 $\frac{3}{8} \times \frac{5}{7} + \frac{5}{8} \times \frac{4}{7}$ A1 oe

Number	Working	Answer	Mark	Notes
16 (a)		600 000	1	B1 cao
(b)	$36 \times 10^{10}$	$3.6 \times 10^{11}$	2	B1 for $36 \times 10^{10}$ or 3600000000000 B1 cao
17(a) i	$57^\circ$	$57^\circ$	3	B1 for $R = 90^\circ$ B1 for $57^\circ$ B1 for both
ii	Angle sum of a triangle is 180 Angle in a semicircle is a right angle	Reasons		
(b) i	$180 - '57'$	$123^\circ$	2	B1 ft on '57'
ii	Opposite angles of a cyclic quadrilateral sum to $180^\circ$	Reason		B1 Opposite angles of a cyclic quadrilateral sum to $180^\circ$
18 i		$(x+4)(x+1)$	3	B2 $(x+4)(x+1)$ (B1 $(x+a)(x+b)$ , where $ab = 4$ ) B1 both ft on (i)
ii		$-1, -4$		
19 (a)		2	1	B1 cao
(b)		(0,3)	1	B1 cao
(c)	$2x + 3 = 0$	$(-1.5, 0)$	2	M1 for $2x + 3 = 0$ oe A1 cao

Number	Working	Answer	Mark	Notes
20 (a)	$\pi \times 10^2 + \pi \times 10 \times 15$	$250\pi$	3	M1 for $\pi \times 10^2$ or $\pi \times 10 \times 15$ M1 for $\pi \times 10^2 + \pi \times 10 \times 15$ A1 cao
(b)	SF length = $\sqrt{64} = 8$ New radius = $8 \times 10$	80	2	B1 for $\sqrt{64}$ or 8 B1 for 80
21(a)	$y + ax^2 = b$ $ax^2 = b - y$ $x^2 = \frac{b - y}{a}$	$x = \pm \sqrt{\frac{b - y}{a}}$	2	M1 isolate $\pm ax^2$ correctly M1 $x^2 = \frac{b - y}{a}$
(b)		B	1	B1 cao
22	$2x, 2x - 2, 2x + 1$ $2x(2x - 2) + 2x(2x + 1) + (2x - 2)(2x + 1)$ $4x^2 - 4x + 4x^2 + 2x + 4x^2 - 2x - 2$ $12x^2 - 4x - 2$	$24x^2 - 8x - 4$	4	B1 for $2x - 2, 2x + 1$ seen M1 for at least one term of $2x(2x - 2) + 2x(2x + 1) + (2x - 2)(2x + 1)$ M1 for all 3 terms A1 cao

Number	Working	Answer	Mark	Notes
23(a) i		1	1	B1 cao
ii		$1\frac{1}{9}$	1	B1 cao
iii		2	1	B1 cao
(b)	$\frac{8\sqrt{2}}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = \frac{8\sqrt{2}}{2} = 4\sqrt{2}$	$4\sqrt{2}$	3	M1 $\frac{8\sqrt{2}}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}}$ A1 $\frac{8\sqrt{2}}{\sqrt{4}}$ oe A1 $4\sqrt{2}$ or $\sqrt{32}$
24(a) i		(180, 0)	2	B1 cao
ii		(90, 2)		B1 cao
(b)		See below	1	B1



Number	Working	Answer	Mark	Notes
25(a)		$(2y-3)(3y+2)$	2	B2 cao (B1 $(ay+b)(cy-d)$ , with $a, b, c, d$ all positive and $ac = 6$ and $bd = 6$ )
(b) (i)	$\frac{(2y-3)(3y+2)}{(3y-2)(3y+2)}$	$\frac{2y-3}{3y-2}$	2	B1 $(3y-2)(3y+2)$ B1 cao
(ii)	$\begin{aligned} & (2[x+2] - 3)\{3[x+2] + 2\} \\ & \text{or} \\ & 6x^2 + 24x + 24 - 5x - 10 - 6 = \\ & 6x^2 + 19x + 8 \end{aligned}$	$(2x+1)(3x+8)$	2	M1 substitute $x + 2$ for $y$ in (a) A1 cao <b>or</b> M1 expand and collect terms A1 cao



## GCSE Mathematics 2540 Paper 4 (Higher) mark scheme

Number	Working	Answer	Mark	Notes
1 (a)	$\frac{1}{5} \times 100$	20%	2	M1 $\frac{1}{5} \times 100$
(b)	$180 \div (2 + 3) = 36$ $2 \times 36 = 72$	£72	2	A1 cao M1 $180 \div (2 + 3)$ A1 cao
2(a)	$1 - (0.1 + 0.35 + 0.36)$	0.19	2	M1 for $1 - (0.1 + 0.35 + 0.36)$ A1 0.19 oe
(b)	$0.35 + 0.36$	0.71	2	M1 $0.35 + 0.36$ A1 0.71 oe
3	1 kg of apples costs £1.28 2 kg of lemons costs $£5.76 - 3 \times £1.28 = £1.92$	96p	3	B1 for £1.28 M1 for $£5.76 - 3 \times £1.28$ ‘ A1 cao
4(a)	$\frac{72}{360} \times 400$	80	2	M1 $\frac{72}{360} \times 400$ A1 cao
(b)	$30\% \text{ of } 360 = 108$	108	2	M1 30% of 360 A1 108°

Number	Working	Answer	Mark	Notes
5 (a)	$5x - x = 12 - 2$	2.5	2	M1 $5x - x = 12 - 2$ A1 2.5 oe
(b)	$4 - 2 = 2y + y$	$2 \frac{2}{3}$	2	M1 $4 - 2 = 2y + y$ A1 $\frac{2}{3}$ oe
6 (a)	$-36 - 4 \times -3$	-24	2	M1 for $-36 - 4 \times -3$ A1 cao
(b)	$y + 4q = 3p$ $4q = 3p - y$	$q = \frac{3p - y}{4}$	2	M1 for a correct method to isolate $\pm 4q$ or $\div 4$ correctly A1 $q = \frac{3p - y}{4}$ oe
7 (a)	$\pi \times 20$	62.8	2	M1 $\pi \times 20$ A1 62.8 or 62.84
(b)	$\frac{30 \times 100}{\sqrt{62.8}} = 47.77$	48	2	M1 $\frac{30 \times 100}{\sqrt{62.8}}$ or $30 \text{ m} \div \sqrt{62.8} \text{ cm}^2$ A1 48

Number	Working	Answer	Mark	Notes
8 (a)		Reflection in the line $x = -2$	2	B1 reflection B1 line $x = -2$
(b)		Triangle with vertices at (4, 2) (8, 2)(8, 8)	2	B2 correct enlargement in correct place (B1 correct enlargement in wrong place)
9 (a)	$2(2x + 3y) + 2(x - 4y)$	$6x - 2y$	2	M1 $2(2x + 3y) + 2(x - 4y)$ A1 cao
(b)	$56 = 6x - 4$	10	2	M1 $56 = '6x - 4'$ A1 10 ft on (a)
10	$(1 + 0.043)^2 \times 5000$  OR 4.3% of £5000 = £215 4.3% of £5215 = £224.245	£5439.24(5)	3	M2 $(1 + 0.043)^2 \times 5000$ A1 £5439.24 or £5439.25 OR M1 for 4.3% of £5000 = £215 M1 4.3% of £5215 = £224.245 A1 £5439.24 or £5439.25
11	$10^2 + 12^2$ $\sqrt{10^2 + 12^2} = 15.62$ $15.62 + 20 + 24$	59.6	4	M1 $10^2 + 12^2$ M1 $\sqrt{10^2 + 12^2}$ M1 '15.62' + 20 + 24 A1 59.6 – 59.65

Number	Working	Answer	Mark	Notes
12 (a)	$a = \frac{5}{2} \times 4$	10	2	M1 $a = \frac{5}{2} \times 4$ A1 10
(b)	$b = 8 \div \frac{5}{2}$	3.2	2	M1 $b = 8 \div \frac{5}{2}$ A1 3.2
13	$800 - 80 = 720$ $\frac{720}{2400} = 30\%$	£2400	3	M1 $800 - 80$ M1 $\frac{720}{2400}$ oe A1 cao
14 (a)		2.5 kg	1	B1 tol $\pm 0.1$
(b)	LQ = 1.5 kg, UQ = 3.4 kg	1.9kg	2	B1 for either LQ or UQ B1 1.8 – 2.0
(c)		IQR ignores outliers	1	B1 ignores outliers oe
15	$4x + 4y = 6$ $2x - 4y = 6$ $6x = 12$	$x = 2, y = -0.5$	3	M1 for a correct process which leads to the elimination of either $x$ or $y$ , allow 1 arithmetical error M1 sub for one variable in one of the equations A1 cao (both)

Number	Working	Answer	Mark	Notes
16 i		$a^{11}$	1	B1 cao
ii		$8b^5$	2	B2 cao (B18 + $b^5$ )
iii		$2pq^2$	2	B2 $2pq^2$ oe (B1 2 + $pq^2$ )
17	$5.947 \times 10^{24} \times 333000$	$1.96 \times 10^{30}$	2	M1 $5.947 \times 10^{24} \times 333000$ A1 $1.96 - 1.965 \times 10^{30}$
18 (a)		Length Volume	2	B1 cao B1 cao
(b)		1	1	B1 cao
19	$\tan x = \frac{5.2}{10}$ $x = \tan^{-1}(0.52)$	27.5	3	M1 $\tan x = \frac{5.2}{10}$ M1 $x = \tan^{-1}(0.52)$ A1 27.47 – 27.5

Number	Working	Answer	Mark	Notes
20 (a)	$M = kR^3$ $3750 = k \times 5^3$ $k = \frac{3750}{125} = 30$	$M = 30R^3$	3	M1 $M = kR^3$ M1 $3750 = k \times 5^3$ A1 $k = 30$
(b)	$M = 30 \times 6^3$	6480	2	M1 $M = 30 \times 6^3$ A1 cao
21	$310 + 240 + 125 + 65 = 740$ $310 \div 740 \times 50$	21	4	M1 $310 + 240 + 125 + 65 = 740$ M1 $310 \div 740 \times 50$ A1 20.95 A1 21
22 (a)	$\frac{\sin x}{12} = \frac{\sin 30}{10}$ $\sin x = \frac{12 \times \sin 30}{10}$	36.9	3	M1 $\frac{\sin x}{12} = \frac{\sin 30}{10}$ oe M1 $\sin x = \frac{12 \times \sin 30}{10}$ A1 36.85-36.9
(b)	$180 - 36.87 - 30 = 113.13$ $\frac{1}{2} \times 10 \times 12 \times \sin 113.13$	55.2	3	M1 use of $\frac{1}{2}ab\sin C$ M1 $\frac{1}{2} \times 10 \times 12 \times \sin 113.13$ must be the included angle A1 55.18 – 55.2

Number	Working	Answer	Mark	Notes
23(a)		$x(x+8)$	1	B1 cao
(b)	$x(x+8) = 40$	$x^2 + 8x - 40 = 0$	2	M1 $x(x+8)=40$ A1
(c)	$x = \frac{-8 \pm \sqrt{8^2 - 4 \times 1 \times -40}}{2}$ $x = \frac{-8 \pm \sqrt{224}}{2}$	3.48, -11.5	3	M1 $x = \frac{-8 \pm \sqrt{8^2 - 4 \times 1 \times -40}}{2}$ M1 $x = \frac{-8 \pm \sqrt{224}}{2}$ A1 3.48, -11.5
(d)		11.48	1	B1 ft
24	$6^2 + 4^2 - 2 \times 6 \times 4 \times \cos 42$ $52 - 48 \cos 42 = 16.329$	4.04	3	M1 $6^2 + 4^2 - 2 \times 6 \times 4 \times \cos 42$ M1 correct use of Bidmas A1 4.04-4.045
25(a)		$x^2 + 2xy + y^2$	1	B1 cao
(b)		$3n - 2$	2	M1 for $3n + k$ , oe, where $k$ is a constant A1 $k = -2$
(c)	$(3n - 2)^2 = 9n^2 - 12n + 4$ $= 3(3n^2 - 4n + 2) - 2$	$3(3n^2 - 4n + 2) - 2$	3	B1 for sight of $(3n - 2)^2$ M1 correct expansion of $(3n - 2)^2$ A1 for a full argument which proves Sophie's statement



# **GCSE Mathematics mock papers**

**2544 (Modular)**

**Unit 4**

**Number, Algebra and Shape, Space and  
Measures 2**





# GCSE Mathematics 2544 Unit 4 (Foundation) mark scheme

## Section A

Number	Working	Answer	Mark	Notes
1 (a)	273 – 121	152	2	M1 for 273 – 121 A1 cao
(b)	$7.50 + 2 \times 4.20$ 20 – “15.90”	4.10	3	M1 for $7.50 + 2 \times 4.20$ M1 for 20 – “15.90” A1 cao
(c)		20 10	2	M1 for evidence of adding 1 hour 40 minutes to 18 30 A1 cao
2 (a)		<i>C</i>	1	B1 cao
(b)		<i>E</i>	1	B1 cao
(c)		<i>B</i> and <i>E</i>	2	B1 for <i>B</i> B1 for <i>E</i>
3 (a)		$\frac{47}{100}$	1	B1 cao
(b)		52%	1	B1 cao
(c)		25%	1	B1 cao
4 (a)		7.2 cm	1	B1 cao
(b)		65°	1	B1 cao
(c)		<i>AB</i> and <i>DC</i> marked	1	B1 cao
5 (a)		Isosceles	1	B1 cao
(b)		<i>A</i>	1	B1 cao
(c)		<i>B</i> and <i>D</i>	1	B1 cao

Number	Working	Answer	Mark	Notes
6 (a) (b)		0.064 25000	1 2	BI cao M1 for $5 \times 5$ or $10 \times 10 \times 10$ A1 cao
7 (a) (b)		3 5	1 1	BI cao BI cao
8 (a) (b)	$24 \div 4 \times 3$	6 18	1 2	BI cao M1 for $24 \div 4$ or 6 A1 cao
9	$33 - 13 = 20$ $20 \div 5$	4	2	M1 for 20 seen A1 cao
10(a) (b)	$3 \times 6 - 8$ $(-4)^2 + 3 \times 3$	10 25	2 2	M1 for $3 \times 6 - 8$ A1 cao M1 for substitution A1 cao
11 (a) (b)	$\frac{3}{8} + \frac{2}{8}$ $\frac{3 \times 2}{5 \times 7}$	$\frac{5}{8}$ $\frac{6}{35}$	2 2	M1 for $\frac{2}{8}$ A1 cao M1 for fraction with denominator of 35 or numerator of 6 A1 cao

Number	Working	Answer	Mark	Notes
12		Correct net	2	B2 for correct net (B1 for 3 rectangles or two right angled triangles within a net)
13 (a)		1 : 5	1	B1 cao
(b)		$1\frac{1}{3}$	1	B1 cao
14		Correct rotation	2	B2 for correct rotation (B1 for triangle of correct orientation but wrong position)
15		Diagram	3	B1 for bearing of $140^\circ \pm 2^\circ$ from Blackport B1 for bearing of $200^\circ \pm 2^\circ$ from Clancy Bay B1 for $\times$ within guidelines
16	$\frac{20}{100} \times 350$	70	2	M1 for $\frac{20}{100} \times 350$ oe A1 cao
17	$360 \div 40$	9	2	M1 for $360 \div 40$ A1 cao
18 (a)		16	1	B1 cao
(b)	$16 \div (20 \div 60)$ or $3 \times 16$	48	2	M1 for $16 \div (20 \div 60)$ or $3 \times 16$ A1 cao
(c)		Graph	2	M1 for straight line with negative gradient A1 for line starting at (50,16) and finishing at (65,0)
19 (a)			2	B2 (B1 for one square missing or extra)
(b)			2	B2 (B1 for one square missing or extra)

## Section B

Number	Working	Answer	Mark	Notes
1 (a)		2 lines of symmetry	2	B2 for both lines of symmetry correct (B1 for 1 line correct)
(b)		Shape reflected	2	B2 for fully correct reflection (B1 for any line correctly reflected)
2	$5.65 \times 3$ $5.40 \div 4$ $7.20 + 16.95 + 5.40$	16.95, 1.35, 29.55	3	B1 for 16.95 B1 for 1.35 B1 ft for 29.55
3 i ii		Cylinder Sphere	2	B1 cao B1 cao
4	$\frac{50}{350}$	$\frac{1}{7}$	2	M1 for $\frac{50}{350}$ oe A1 cao
5 (a) i ii (b) i ii (c)		3 -11 3 2 -3	5	B1 cao B1 cao B1 for 3 or -3 B1 for 2 or -2 B1 cao

Number	Working	Answer	Mark	Notes
6 (a)	$3810 - 3540 = 270$ $270 \times 36 = 9720$	97.20	4	M1 for $3810 - 3540 (=270)$ M1 for “270” $\times 36$ A1 for “9720” $\div 100$ A1 for 97.20
(b)	$37.60 \div 40$	94p or £0.94	3	M1 for $37.60 \div 4$ A1 for digits 94 A1 for correct units with answer
7		Drawing	3	B1 for angle $B$ drawn within tolerance B1 for angle $A$ drawn within tolerance B1 for completely correct triangle within tolerance
8	$475 \times 1.96$	931	2	M1 for $475 \times 1.96$ A1 cao
9	$\frac{20}{100} \times 700 (=140)$ $700 + 140$	840	3	M1 for $\frac{20}{100} \times 700 (=140)$ oe M1 for $700 + “140”$ A1 cao
10 i ii	$180 - 34 (=146)$ “146” $\div 2$	73	3	M1 for $(180 - 34) \div 2$ A1 cao B1 for ‘angles in a triangle add to $180^\circ$ and isosceles triangle’
11 (a)	$1.5 \times 40 + 20$	80	2	M1 for $1.5 \times 40 + 20$ A1 cao
(b)	$(180 - 20) \div 40$	4	2	M1 for $(180 - 20) \div 40$ A1 cao



Number	Working	Answer	Mark	Notes
12 (a)		10	1	B1 cao
(b)		11	1	B1 cao
(c)		4.5	1	B1 cao
13		Enlargement	2	B2 for correctly enlarged shape (B1 for any two lines correct length)
14 (a)		17	1	B1 cao
(b)	$4y = 9 - 2$	$7 \frac{1}{4}$	2	M1 for $4y = 9 - 2$ A1 oe
(c)	$2w + 2 = 10$	4	2	M1 for $2w + 2 = 10$ or $w + 1 = 5$ A1 cao
15	$3 + 5 = 8$ $24.80 \div "8"$ $(5 - 3) \times "3.10"$	6.20	3	M1 for $24.80 \div (3+5)$ (=3.10) M1 for $3.10 \times 5$ or $3.10 \times 3$ or $3.10 \times 2$ A1 cao
16	$\pi \times 5^2$	78.5 cm <sup>2</sup>	3	M1 for $\pi \times 5^2$ A1 cao B1 for cm <sup>2</sup>
17 (a) i		$x^7$	2	B1 cao
ii		$y^4$	1	B1 cao
(b)		Explanation	1	B1 for 'no equals sign' or 'it is an expression' oe
18	$AC^2 = 6^2 + 10^2$ $\sqrt{36+100}$	11.7	3	M1 for $6^2 + 10^2$ M1 for $\sqrt{36+100}$ A1 cao

## GCSE Mathematics 2544 Unit 4 (Higher) mark scheme

### Section A

Number	Working	Answer	Mark	Notes
1 (a)		$1\frac{9}{15}$	1	B1
(b)	$35 \div 7 = 5$ $5 \times 3 = 15$		2	M1 for $35 \div 7$ or 5 seen A1 cao
(c)	$3 \div 8$	0.375	2	M1 for a valid attempt to divide 3 by 8 or 0.3... seen A1 cao
2	$2+3 = 5$ $= 5 \frac{7+20}{28}$	$5\frac{27}{28}$	3	M1 for common denominator of 28 M1 dep for one numerator correct or $\frac{27}{28}$ seen A1 cao
3 (a)	$5x - 3x = -2$ $2x = -2$	-1	2	M1 for $5x - 3x = -2$ oe A1 cao
(b)	$y - 5 = 2(6 - y)$ $y - 5 = 12 - 2y$ $y + 2y = 12 + 5$ $3y = 17$	$\frac{17}{3}$	3	M1 for $y - 5 = 2(6 - y)$ or $12 - 2y$ M1 for $y + 2y = 12 + 5$ oe A1 for $\frac{17}{3}$ oe
4	$24 \div 6 = 4$ $4 \times 4$	16	2	M1 for $24 \div 6$ or 4 seen A1 cao

Number	Working	Answer	Mark	Notes
5 (a)		16	1	B1
(b)	"16" $\div$ (20 $\div$ 60)	48	2	M1 for "16" $\div$ "time" A1 cao
(c)		Line to 80	2	B2 for straight line from (50, 16) to (65, 0) (B1 for straight line from (50, 16) to time axis)
6		Correct $P$	3	B1 for line $140^\circ$ from Blackport $\pm 2^\circ$ B1 for line $200^\circ$ from Clancy Bay $\pm 2^\circ$ B1 for correct position
7	$3y = 7 - 5x$	$\frac{7 - 5x}{3}$	2	M1 for $3y = 7 - 5x$ oe A1 for $\frac{7 - 5x}{3}$ oe
8 (a)		$x \geq -1$	2	B2 (B1 for $x \leq -1$ or $x > -1$ )
(b)		-2, -1, 0, 1, 2	2	B2 (B1 for 1 omission or 1 extra)
9 (a)		$9^{15}$	1	B1
(b)		$7^{21}$	1	B1
10	$5y > -3 - 7$ $5y > -10$	$y > -2$	2	M1 for $5y > -3 - 7$ or $5y > -10$ A1 cao

Number	Working	Answer	Mark	Notes
11(a)			2	B2 (B1 for one square missing or extra)
(b)			2	B2 (B1 for one square missing or extra)
12		rotation 180° centre (0, 0)	3	M1 for rotation or 2 correct reflections on diagram... ignore labels M1 (dep) for 180° or correct centre A1 cao
13		$(x + 11)(x - 3)$ 3 or -11	3	B2 for $(x + 11)(x - 3)$ (B1 for $(x \pm 11)(x \pm 3)$ ) B1 ft
14		(D), C, E, A, F, B	3	B3 for all correct (B2 for 3 or 4 correct B1 for 1 or 2 correct)
15		34° reason	2	B1 for 34° B1 for angle at centre = $2 \times$ angle at circumference oe

Number	Working	Answer	Mark	Notes
16		explanation	2	B2 for if $n = \text{odd}$ , then $n^3 = \text{odd}$ , and $\text{odd} + \text{odd} = \text{even}$ if $n = \text{even}$ , then $n^3 = \text{even}$ , and $\text{even} + \text{even} = \text{even}$ oe (B1 for less clear explanation or substituting at least 3 different values to show it is true)
17 (a)		$\frac{1}{36}$	1	B1
(b)		9	2	M1 for $3^2$ A1 cao
18	$\frac{6 + \sqrt{8}}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}}$ $= \frac{6\sqrt{2} + \sqrt{8}\sqrt{2}}{2}$	$3\sqrt{2} + 2$	3	M1 for $\times \frac{\sqrt{2}}{\sqrt{2}}$ M1 for $\frac{6\sqrt{2} + \sqrt{8}\sqrt{2}}{2}$ oe A1 cao (accept $p = 3, q = 2$ )
19	Let $BP = x$ $AP = 4x$ $AB = 5x$ $BC = 3x$ $AC^2 = (5x)^2 - (3x)^2$ $AC = 4x$ $\sin B = \frac{4x}{5x} = \frac{4}{5}$	Proof	4	M1 for $AB = 5x$ or $BC = 3x$ M1 for correct use of Pythagoras A1 for $AC = 4x$ B1 for $\sin B = \frac{4x}{5x}$

## Section B

Number	Working	Answer	Mark	Notes
1		Reflection	2	B2 (B1 for 2 lines in correct position)
2	$24.8 \div 8 = 3.1$ $3 \times 3.1 = 9.3$ $5 \times 3.1 = 15.5$ $15.5 - 9.3$	6.20	3	M1 for $24.8 \div 8$ or 3.1 seen A1 for 9.3 or 15.5 B1 for 6.20
3	$\pi(5)^2$	78.5 $\text{cm}^2$	3	M1 for $\pi(5)^2$ oe A1 for answer that rounds to 78.5 B1 (indep) for $\text{cm}^2$
4		$C = 5a + 2f$	3	B3 for $C = 5a + 2f$ oe (B2 for $5a + 2f$ B1 for $C =$ an expression in $a$ and $b$ or $5a$ oe. or $2f$ oe seen)
5	$\frac{20}{120}$	$\frac{1}{6}$	2	M1 for converting both to the same units A1 cao
6		Rotation	2	B2 for correct rotation (B1 for correct orientation or $90^\circ$ clockwise rotation)
7(a) i		$x^{12}$ $y^4$	2	B1 B1
ii		reason	1	B1 for no equal sign or it is an expression
(b)				

Number	Working	Answer	Mark	Notes
8	$x + 7 + x + 7 + 2x - 1 = 27$ $4x + 13 = 27$ $4x = 27 - 13 = 14$ $x = 3.5$ Largest side = $3.5 + 7$	10.5	4	M1 for $x + 7 + x + 7 + 2x - 1 = 27$ oe M1 for correctly rearranging 'equation' with $x$ terms on one side and rest on other side (accept use of only 2 sides) A1 for 3.5 oe B1 ft (dep on M1) for '3.5' + 7 M1 for $6.5 \div 2.6$ or $2.5$ seen A1 cao
9	$6.5 \div 2.6$ (=2.5) '2.5' $\times$ 3	7.5	2	M1 for $6.5 \div 2.6$ or $2.5$ seen A1 cao
10(a)		9, 3, 3	2	B2 (B1 for 1 correct)
(b)		graph	2	M1 for plotting at least 4 points correctly and joining with a curve or plotting all correct points but not joined with a curve A1 cao
11	4 ... 124    5 ... 245 4.6 ... 190    4.7 ... 203 4.65 ... 196	4.7	4	M1 for correct trial between 4 and 5 inclusive M1 for further correct trial between 4 and 5 exclusive M1 for trial of 4.65 A1 cao
12	$9.1 \times \tan 24^\circ$ = 4.051581	4.05	3	M1 for use of tan M1 for $9.1 \times \tan 24^\circ$ A1 for 4.05 or better
13	$(1.05)^3 \times 6000$ or $5 \div 100 \times 6000 = 300$ Total 6300 $5 \div 100 \times 6300 = 315$ Total 6615 $5 \div 100 \times 6615 = 330.75$	6945.75	3	B1 for $(1.05)^3 \times 6000$ M1 for $(1.05)^3 \times 6000$ A1 cao or M1 for $5 \div 100 \times 6000 + 6000$ or 6300 seen M1 for $5 \div 100 \times 6300 + 6300$ and $5 \div 100 \times 6615 + 6615$ A1 cao

Number	Working	Answer	Mark	Notes
14	$\frac{580.09... - 2.03...}{13.35} = \frac{578.06...}{13.35}$	43.3006069	2	B2 for answer rounds to 43.3 (B1 for 578... or 580.09.. or 2.03... seen)
15		$2b(3a + c)$ $\frac{ac^2}{b}$ $3a^2$	3	B1 B1 B1
16	$100 \div 80 \times 27.60$	34.50	3	B1 for 80 or 0.8 seen M1 for $100 \div 80 \times 27.60$ oe A1 cao
17 (a)	$24.5 \times 6.5$	159.25	2	B2 cao (B1 for $24.5 \times x$ or $6.5 \times x$ ) accept 24.49999 or 6.49999 oe)
(b)	$23.5 \div 6.5$	3.615384615	2	B2 for 3.615 or better (B1 for $23.5 \div 6.5$ or $23.5 \div 6.49999$ oe)
18	Area sector = $80 \div 360 \times \pi(6.2)^2$ = 26.83618... Area triangle = $0.5 \times 6.2 \times 6.2 \times \sin 80^\circ$ = 18.928 ... $26.836 - 18.928 = 7.908$	7.91	5	M1 for $80 \div 360 \times \pi(6.2)^2$ or 26.83... seen M1 for $0.5 \times 6.2 \times 6.2 \times \sin 80^\circ$ or 18.92... seen M1 for 26.83... or 18.92... seen M1 for 'area sector' – 'area triangle' A1 for answer that rounds to 7.91

Number	Working	Answer	Mark	Notes
19	$4x^2 = 11x + 3$ $4x^2 - 11x - 3 = 0$ $(4x + 1)(x - 3) = 0$ $x = -\frac{1}{4}$ or $3$ $y = \frac{1}{4}$ or $36$	$x = -\frac{1}{4}$ $y = 36$ $x = 3$ $y = \frac{1}{4}$	5	B1 for $4x^2 = 11x + 3$ oe M1 for $(4x \pm 1)(x \pm 3)$ A1 for $x = -\frac{1}{4}$ or $3$ M1 for substitution to get $y$ A1 for $y = \frac{1}{4}$ or $36$

# **GCSE Mathematics mock papers**

## **1380 (Linear)**

**NB Paper 3 and Paper 4 for 1380 only**



# GCSE Mathematics 1380 Paper 3 (Higher) mark scheme

Number	Working	Answer	Mark	Notes														
1(a)	$\frac{20 \times 30}{8 \times 5} = \frac{600}{40}$	15	2	B1 $\frac{20 \times 30}{8 \times 5}$ or $\frac{19 \times 30}{8 \times 5}$ or $\frac{20 \times 31}{8 \times 5}$ B1 14 - 16														
(b)		15	1	B1 ft on (a)														
2	$80 \times \frac{15}{100} = 12$ $80 + 12 = 92$	£92	3	M1 $80 \times \frac{15}{100}$ A1 12 A1 92 <b>Or</b> M2 $80 \times \frac{115}{100}$ A1 92 <b>Or</b> M1 for attempt to find 10% and 5% of £80 A1 12 A1 92														
3	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>x</td> <td>-1</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>y</td> <td>12</td> <td>10</td> <td>8</td> <td>6</td> <td>4</td> <td>2</td> </tr> </table>	x	-1	0	1	2	3	4	y	12	10	8	6	4	2		3	B1 for any correct (x,y) B1 any other correct (x,y) B1 correct line
x	-1	0	1	2	3	4												
y	12	10	8	6	4	2												

Number	Working	Answer	Mark	Notes										
4	$x = 124 - 78$  Angles on straight line sum to 180 Corresponding angles Angles in a triangle sum to 180	46	2	M1 sight of 56 A1 46										
5	Square $4 \times 4 = 16$ Trapezium $\frac{(4+8)}{2} \times (12-4) = 48$ <b>Or</b> Rectangle $4 \times 12 = 48$ Triangle $\frac{4 \times 8}{2} = 16$	64	4	M1 for $4 \times 4$ or 16 M1 for $\frac{(4+8)}{2} \times (12-4)$ or 48 M1 (dep on at least 1 previous M1) A1 for 64 <b>Or</b> M1 $4 \times 12$ or 48 M1 $\frac{4 \times 8}{2}$ or 16 M1 (dep on at least 1 previous M1) A1 for 64										
6	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>4</td><td>3 6</td></tr> <tr><td>5</td><td>2 8</td></tr> <tr><td>6</td><td>2 3 5</td></tr> <tr><td>7</td><td>3 6 6 9 9</td></tr> <tr><td>8</td><td>1 2 4</td></tr> </table> Key 8   4 represents 8.4 cm	4	3 6	5	2 8	6	2 3 5	7	3 6 6 9 9	8	1 2 4	Diagram	3	B3 fully correct including key (B2 1 error or omission in table or key) (B1 2 errors or omissions in table or key) (B2 unordered, no errors otherwise, with key) (B1 unordered 1 or more errors, with key or unordered, no errors, with key)
4	3 6													
5	2 8													
6	2 3 5													
7	3 6 6 9 9													
8	1 2 4													

Number	Working	Answer	Mark	Notes
7	Males 60% of 1500 = 900 Females 40% of 1500 = 600 Males like tennis 30% of 900 = 270 Females like tennis 40% of 600 = 240	510	4	B1 for 900 B1 for 1500 – ‘900’ M1 for attempt to find 270 or 240 B1 cao
8 (a)	$q^2 + 5q + 4q + 20$	$q^2 + 9q + 20$	2	M1 for sight of 3 or 4 out of 4 terms correct A1 cao
(b)	$6k^2 - 9mk + 4km - 6m^2$	$6k^2 - 5mk - 6m$	2	M1 for sight of 3 out of 4 terms correct including signs or 4 out of 4 terms correct ignoring signs A1 cao
9	$5x + 5 = 3x + 12$ $5x - 3x = 12 - 5$	$x = 3.5$	3	B1 $5x + 5 (= 3x + 12)$ M1 correct process to isolate $2x$ or $-2x$ A1 cao
10 i	$4^{8-6}$	16	2	M1 for $4^{8-6}$ A1 cao
ii	$\frac{2^{10}}{2^{11}} = \frac{1}{2}$	$\frac{1}{2}$	2	M1 for $\frac{2^{10}}{2^{11}}$ A1 oe

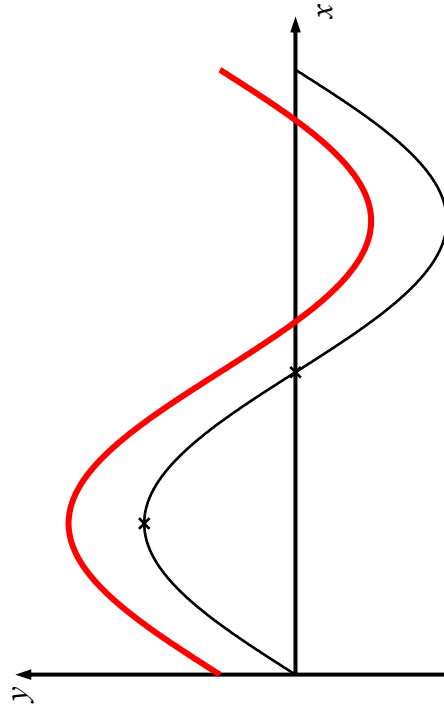
Number	Working	Answer	Mark	Notes
11 (a)	$7 \times 12$	84	2	M1 $7 \times 12$ A1 cao
(b)	$84 \div 8$	10.5	2	M1 '84' $\div 8$ A1 ft
12	$2\frac{1}{2} + 1\frac{2}{3} = 3\frac{3}{6} + \frac{4}{6}$ $= 3\frac{7}{6} = 4\frac{1}{6}$	$4\frac{1}{6}$	3	M1 for attempt to write the fractions over a common denominator A1 $\frac{3}{6} + \frac{4}{6}$ A1 cao
13	$10 \times 30 + 30 \times 24 + 50 \times 40 + 6 \times 70$ $= 3440$ $3440 \div 100$	34.4	4	M1 $\Sigma fx$ use of $x$ consistently in each interval (may include endpoints) M1 (dep) use of midpoints M1 (dep on 1 <sup>st</sup> M1) $\frac{\Sigma fx}{\Sigma f}$ A1 cao

Number	Working	Answer	Mark	Notes
14 (a)	$\frac{6 \times 8}{2} \times 20$	480	2	M1 for $\frac{6 \times 8}{2} \times 20$
(b)	'480'×6	2880	2	A1 cao M1 '480'×6 A1 ft
15 (a)		$\frac{5}{8}$	2	B1 cao $\frac{5}{8}$ on the first branch
		$\frac{3}{8}, \frac{5}{8}$		B1 cao $\frac{3}{8}, \frac{5}{8}$ respectively on each pair of the second branches
(b)	$\frac{5}{8} \times \frac{5}{8}$	$\frac{25}{64}$	2	M1 $\frac{5}{8} \times \frac{5}{8}$ A1 cao
(c)	$\frac{5}{8} \times \frac{3}{8} + \frac{5}{8} \times \frac{3}{8}$	$\frac{30}{64}$	3	M1 $\frac{5}{8} \times \frac{3}{8}$ M1 $\frac{5}{8} \times \frac{3}{8} + \frac{5}{8} \times \frac{3}{8}$ A1 cao
(d)	$\frac{3}{8} \times \frac{5}{7} + \frac{5}{8} \times \frac{4}{7} = \frac{35}{56}$	$\frac{5}{8}$	2	M1 $\frac{3}{8} \times \frac{5}{7} + \frac{5}{8} \times \frac{4}{7}$ A1 $\frac{5}{8}$ oe

Number	Working	Answer	Mark	Notes
16 (a)		600 000	1	B1 cao
(b)	$36 \times 10^{10}$	$3.6 \times 10^{11}$	2	B1 for $36 \times 10^{10}$ or 3600000000000 B1 cao
17 (a) i	$57^\circ$	$57^\circ$	3	B1 for $R = 90^\circ$ B1 for $57^\circ$
ii	Angle sum of a triangle is $180^\circ$ Angle in a semi-circle is a right angle	Reasons		B1 for both angle sum of a triangle is $180^\circ$ Angle in a semi-circle is a right angle
(b) i	$180 - '57'$	$123^\circ$	2	B1 ft on '57'
ii	Opposite angles of a cyclic quadrilateral sum to $180^\circ$	Reason		B1 opposite angles of a cyclic quadrilateral sum to $180^\circ$
18 i		$(x+4)(x+1)$	3	B2 $(x+4)(x+1)$ (B1 $(x+a)(x+b)$ Where $ab = 4$ )
ii		$-1, -4$		B1 both fit on (i)
19 (a)		$2$	1	B1 cao
(b)		$(0, 3)$	1	B1 cao
(c)	$2x + 3 = 0$	$(-1.5, 0)$	2	M1 for $2x + 3 = 0$ oe A1 cao

Number	Working	Answer	Mark	Notes
20 (a)	$\pi \times 10^2 + \pi \times 10 \times 15$	$250\pi$	3	M1 for $\pi \times 10^2$ or $\pi \times 10 \times 15$ M1 for $\pi \times 10^2 + \pi \times 10 \times 15$ A1 cao
(b)	SF length = $\sqrt{64} = 8$ New radius = $8 \times 10$	80	2	B1 for $\sqrt{64}$ or 8 B1 for 80
21 (a)	$y + ax^2 = b$ $ax^2 = b - y$	$x = \pm \sqrt{\frac{b-y}{a}}$	2	M1 $x^2 = \frac{b-y}{a}$ A1 (condone omission of $\pm$ )
(b)	$x^2 = \frac{b-y}{a}$	B	1	B1 cao
22	$2x, 2x - 2, 2x + 1$ $2x(2x - 2) + 2x(2x + 1) + (2x - 2)(2x + 1)$ $4x^2 - 4x + 4x^2 + 2x + 4x^2 - 2x - 2$ $12x^2 - 4x - 2$	$24x^2 - 8x - 4$	4	B1 for $2x - 2, 2x + 1$ seen M1 for at least one term of $2x(2x - 2) + 2x(2x + 1) + (2x - 2)(2x + 1)$ M1 for all 3 terms A1 cao

Number	Working	Answer	Mark	Notes
23(a) i		1	1	B1 cao
ii		$\frac{1}{9}$	1	B1 cao
iii		2	1	B1 cao
(b)	$\frac{8}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = \frac{8\sqrt{2}}{2} = 4\sqrt{2}$	$4\sqrt{2}$	3	M1 $\frac{8}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}}$ A1 $\frac{8\sqrt{2}}{\sqrt{4}}$ oe A1 $4\sqrt{2}$ or $\sqrt{32}$
24(a) i		(180, 0)	2	B1 cao
ii		(90, 2)		B1 cao
(b)		See below	1	B1



Number	Working	Answer	Mark	Notes
25(a)		$(2y - 3)(3y + 2)$	2	B2 cao (B1 $(ay + b)(cy - d)$ , with $a, b, c, d$ all positive and $ac = 6$ and $bd = 6$ )
(b)	$(\{2[x + 2] - 3\}\{3[x + 2] + 2\})$ <b>or</b> $6x^2 + 24x + 24 - 5x - 10 - 6 =$ $6x^2 + 19x + 8$	$(2x + 1)(3x + 8)$	2	M1 substitute $x + 2$ for $y$ in (a) A1 cao <b>or</b> M1 expand and collect terms A1 cao
26		24 30	2	B1 cao B1 cao



## GCSE Mathematics 1380 Paper 4 (Higher) mark scheme

Number	Working	Answer	Mark	Notes
1 (a)	$\frac{1}{5} \times 100$	20%	2	M1 $\frac{1}{5} \times 100$ A1 cao
(b)	$180 \div (2 + 3) = 36$ $2 \times 36 = 72$	£72	2	M1 $180 \div (2 + 3)$ A1 cao
2(a)	$1 - (0.1 + 0.35 + 0.36)$	0.19	2	M1 for $1 - (0.1 + 0.35 + 0.36)$ A1 0.19 oe
(b)	$0.35 + 0.36$	0.71	2	M1 $0.35 + 0.36$ A1 0.71 oe
3	1 kg of apples costs £1.28 2 kg of lemons costs $\text{£}5.76 - 3 \times \text{£}1.28 = \text{£}1.92$	96p	3	B1 for £1.28 M1 for $\text{£}5.76 - 3 \times \text{£}1.28$ A1 cao
4(a)	$\frac{72}{360} \times 400$	80	2	M1 $\frac{72}{360} \times 400$ A1 cao
(b)	30% of 360 = 108	108	2	M1 30% of 360 or 108 seen A1 cao labelled pie chart
5 (a)	$5x - x = 12 - 2$	2.5	2	M1 $5x - x = 12 - 2$ A1 2.5 oe
(b)	$4 - 2 = 2y + y$	$\frac{2}{3}$	2	M1 $4 - 2 = 2y + y$ A1 $\frac{2}{3}$ oe

Number	Working	Answer	Mark	Notes
6 (a)	$-36 - 4 \times -3$	-24	2	M1 for $-36 - 4 \times -3$ A1 cao
(b)	$y + 4q = 3p$ $4q = 3p - y$	$q = \frac{3p - y}{4}$	2	M1 for a correct method to isolate $\pm 4q$ or $\div 4$ correctly A1 $q = \frac{3p - y}{4}$ oe
7 (a)	$\pi \times 20$	62.8	2	M1 $\pi \times 20$ A1 62.8-62.84
(b)	$\frac{30 \times 100}{'62.8'} = 47.77$	48	2	M1 $\frac{30 \times 100}{'62.8'}$ or $30 \text{ m} \div '62.8 \text{ cm}'$ A1 48
8 (a)		Reflection in the line $x = -2$	2	B1 reflection B1 line $x = -2$
(b)		Triangle with vertices at (4,2)(8,2)(8,8)	2	B2 correct enlargement in correct place (B1 correct enlargement in wrong place)
9(a)	$2(2x + 3y) + 2(x - 4y)$	$6x - 2y$	2	M1 $2(2x + 3y) + 2(x - 4y)$ A1 cao
(b)	$56 = 6x - 4$	10	2	M1 $56 = '6x - 4'$ A1 10 ft on (a)

Number	Working	Answer.	Mark	Notes
10	$(1 + 0.043)^2 \times 5000$  OR 4.3% of £5000 = £215 4.3% of £5215 = £224.245	£5439.24(5)	3	M2 $(1 + 0.043)^2 \times 5000$ A1 £5439.24 - £5439.25 OR M1 for 4.3% of £5000 = £215 M1 4.3% of £5215 = £224.245 A1 £5439.24 - £5439.25
11	$10^2 + 12^2$ $\sqrt{10^2 + 12^2} = 15.62$ $15.62 + 20 + 24$	59.6 cm	4	M1 $10^2 + 12^2$ M1 $\sqrt{10^2 + 12^2}$ M1 '15.62' + 20 + 24 A1 59.6 – 59.65
12 (a)	$a = \frac{5}{2} \times 4 = 10$	10	2	M1 $a = \frac{5}{2} \times 4$ A1 10
(b)	$b = 8 \div \frac{5}{2}$	3.2	2	M1 $b = 8 \div \frac{5}{2}$ A1 3.2
13	$800 - 80 = 720$ $\frac{720}{30\%} = 2400$	£2400	3	M1 $800 - 80$ M1 $\frac{720}{30\%}$ oe A1 cao

Number	Working	Answer	Mark	Notes
14 (a)		2.5 kg	1	B1 tol $\pm 0.1$
(b)	LQ = 1.5 kg, UQ = 3.4 kg	1.9 kg	2	B1 for either LQ or UQ B1 1.8 – 2.0
(c)		IQR ignores outliers	1	B1 ignores outliers oe
(d)		Box plot	3	B1 for correct “whiskers” B1 correct quartiles B1 correct median marked
15	$4x + 4y = 6$ $2x - 4y = 6$ $6x = 12$	$x = 2, y = -0.5$	3	M1 for a correct process which leads to the elimination of either $x$ or $y$ , allow 1 arithmetical error M1 sub for one variable in one of the equations A1 cao (both)
16 i		$a^{11}$	1	B1 cao
ii		$8b^5$	2	B2 cao (B1 $8 + b^5$ )
iii		$2pq^2$	2	B2 $2pq^2$ oe (B1 $2 + pq^2$ )
17	$5.947 \times 10^{24} \times 333000$	$1.96 \times 10^{30}$	2	M1 $5.947 \times 10^{24} \times 333000$ A1 $1.96 - 1.965 \times 10^{30}$

Number	Working	Answer	Mark	Notes
18	$\tan x = \frac{5.2}{10}$ $x = \tan^{-1}(0.52)$	27.5	3	M1 $\tan x = \frac{5.2}{10}$ M1 $x = \tan^{-1}(0.52)$ A1 27.47 – 27.5
19 (a)	$M = kR^3$ $3750 = k \times 5^3$ $k = \frac{3750}{125} = 30$	$M = 30R^3$	3	M1 $M = kR^3$ M1 $3750 = k \times 5^3$ A1 $k = 30$
(b)	$M = 30 \times 6^3$	6480	2	M1 $M = 30 \times 6^3$ A1 cao
20	$310 + 240 + 125 + 65 = 740$ $310 \div 740 \times 50$	21	4	M1 $310 + 240 + 125 + 65 = 740$ M1 $310 \div 740 \times 50$ A1 20.95 A1 21

Number	Working	Answer	Mark	Notes
21 (a)	$\frac{\sin x}{12} = \frac{\sin 30}{10}$ $\sin x = \frac{12 \times \sin 30}{10}$	36.9	3	M1 $\frac{\sin x}{12} = \frac{\sin 30}{10}$ oe M1 $\sin x = \frac{12 \times \sin 30}{10}$ A1 36.85-36.9
(b)	$180 - 36.87 - 30 = 113.13$ $\frac{1}{2} \times 10 \times 12 \times \sin 113.13$	55.2	3	M1 use of $\frac{1}{2} ab \sin C$ M1 $\frac{1}{2} \times 10 \times 12 \times \sin 113.13$ must be the included angle A1 55.18 – 55.2
22(a)		$x(x+8)$	1	B1 cao
(b)	$x(x+8) = 40$	$x^2 + 8x - 40 = 0$	2	M1 $x(x+8)=40$ A1
(c)	$x = \frac{-8 \pm \sqrt{8^2 - 4 \times 1 \times -40}}{2}$ $x = \frac{-8 \pm \sqrt{224}}{2}$	3.48, -11.5	3	M1 $x = \frac{-8 \pm \sqrt{8^2 - 4 \times 1 \times -40}}{2}$ M1 $x = \frac{-8 \pm \sqrt{224}}{2}$ A1 3.48, -11.5
(d)		11.48	1	B1 ft

Number	Working	Answer	Mark	Notes
23	$6^2 + 4^2 - 2 \times 6 \times 4 \times \cos 42$ $52 - 48 \cos 42 = 16.329$	4.04	3	M1 $6^2 + 4^2 - 2 \times 6 \times 4 \times \cos 42$ M1 correct use of Bidmas A1 4.04-4.045
24 (a)		$x^2 + 2xy + y^2$	1	B1 cao
(b)		$3n - 2$	2	M1 for $3n + k$ , oe, where $k$ is a constant A1 $k = -2$
(c)	$(3n - 2)^2 = 9n^2 - 12n + 4$ $= 3(3n^2 - 4n + 2) - 2$	$3(3n^2 - 4n + 2) - 2$	3	B1 for sight of $(3n - 2)^2$ M1 correct expansion of $(3n - 2)^2$ A1 for a full argument which proves Sophie's statement



# **GCSE Mathematics**

**2381 (Modular)**

**Mock papers**



**GCSE Mathematics mock papers  
2381 (Modular)**

**Unit 2**

**Number, Algebra and Shape, Space and  
Measures 1**

**Stage 1**

## GCSE Mathematics 2381 (Modular)

### Unit 2 Stage 1 Foundation mark scheme

<b>Question</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>
Answer	C	B	E	D	E	C	A	C	E	B
<b>Question</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>
Answer	D	E	B	E	A	B	C	D	C	D
<b>Question</b>	<b>21</b>	<b>22</b>	<b>23</b>	<b>24</b>	<b>25</b>					
Answer	B	C	E	A	D					

## GCSE Mathematics 2381 (Modular)

### Unit 2 Stage 1 Higher mark scheme

<b>Question</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>
Answer	D	D	B	C	D	E	A	E	D	E
<b>Question</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>
Answer	C	D	C	E	E	A	A	C	D	B
<b>Question</b>	<b>21</b>	<b>22</b>	<b>23</b>	<b>24</b>	<b>25</b>					
Answer	C	E	D	D	B					

# **GCSE Mathematics mock papers**

**2381 (Modular)**

**Unit 2**

**Number, Algebra and Shape, Space and  
Measures 1**

**Stage 2**



## GCSE Mathematics 2381 Unit 2 Stage 2 Foundation mark scheme

Number	Working	Answer	Mark	Notes
1(a)		25	2	B1 cao
(b)		3		B1 for 3 (accept -3 and $\neq 3$ )
2(a)		4 <i>m</i>	1	B1 for 5 <i>m</i> (accept <i>m</i> 5, $5 \times m$ , $m \times 5$ )
(b)		5 <i>gh</i>	1	B1 cao
(c)		2 <i>ef</i>	1	B1 cao
3(a)		12	1	B1 cao
3(b)	$(4 \times 3) \times 2$ Or $(4 \times 3) + (4 \times 3)$	24	2	M1 for $(4 \times 3) \times 2$ or $(4 \times 3) + (4 \times 3)$ A1 cao
4	$20 - (1.15 \times 6 + 0.90 \times 8)$ $= 20 - (6.90 + 7.20)$ $= 20 - 14.10$	5.90	4	M1 for either $1.15 \times 6$ or $0.90 \times 8$ or $6.9(0)$ or $7.1(0)$ seen A1 for 14.10 M1 for 20 - "14.10" A1 cao
5 i		45	2	B1 cao
ii		Reason		B1 for "base angles of an isosceles triangle are equal"
6	$12.50 \times 1.48 = 18.50$ $18.50 - 18$ Or $18 \div 1.48 = 12.16(21\dots)$ $12.50 - 12.16$	Cheaper in Spain by €0.50  Cheaper in Spain by 34p	3	M1 for $12.50 \times 1.48$ or $18 \div 1.48$ M1 (dep) for "18.50" - 18 or $12.50 - "12.16"$ A1 for Cheaper in Spain by €0.50 or Cheaper in Spain by 34p
7	$35 \times 4$	140	2	M1 for $35 \times 4$ A1 cao

Number	Working	Answer	Mark	Notes
8	$\frac{1}{2} \times (8 - 2) \times 5 + 2 \times 5$ or $\frac{1}{2} \times (8 + 2) \times 5$	25	2	M1 for $\frac{1}{2} \times (8 - 2) \times 5 + 2 \times 5$ or M1 for correct substitution of $\frac{1}{2} \times (8 + 2) \times 5$ A1 cao
9(a)		7 5 3 1	2	B2 for a fully correct table
(b)		-1 Straight line from (-1, 7) to (3, -1)	2	(B1 for 1 or 2 correct entries in the table) B2 for a straight line from (-1, 7) to (3, -1) (B1 ft from (a) for at least 4 'correct' plots or for a single line of gradient -2 or for a single line passing through (0, 5) with a negative gradient)

## GCSE Mathematics 2381 (Modular) Unit 2 Stage 2 Higher mark scheme

Number	Working	Answer	Mark	Notes
1(a)		$5^7$	1	B1 cao
(b)		$11^6$	1	B1 cao
2 i	$180 - (90 + 58)$	32	3	B1 for 32
ii		Reasons		B1 for “angles in a triangle = 180” B1 for “corresponding angles” oe
3	$x \times 40 + y \times 25$	$40x + 25y$	2	B2 for $40x + 25y$ oe (B1 for $40x$ or $25y$ )
4	$160 \div (8 \times 5)$	4	2	M1 for $160 \div 8$ (or 20 seen) $160 \div 5$ (or 32 seen) or $8 \times 5$ (or 40 seen) A1 cao
5(a)		7 5 3 1 -1	2	B2 for a fully correct table (B1 for 1 or 2 correct entries in the table)
(b)		Straight line from (-1, 7) to (3, -1)	2	B2 for a straight line from (-1, 7) to (3, -1) (B1 ft from (a) for at least 4 ‘correct’ plots or for a single line of gradient -2 or for a single line passing through (0, 5) with a negative gradient)
6	$3.8 \div 5 \times 10^8 \div 10^3$ $= 0.76 \times 10^5$	$7.6 \times 10^4$	2	B2 for $3.8 \times 10^5$ (B1 for 380 000 000 <b>and</b> 5000 seen or 76 000 or $7.6 \times 10^n$ where $n \neq 4$ )
7	$360 - (90 + 90 + 50)$	130	3	B1 for identifying a $90^\circ$ angle at S or T M1 for $360 - (90 + 90 + 50)$ oe A1 cao

Number	Working	Answer	Mark	Notes
8(a) (b)	$\frac{2x(x+4)}{(x+4)(x-5)}$	$\frac{(y-1)(y+1)}{2x}$ $\frac{x-5}{x-5}$	1 3	B1 cao B1 for $2x(x+4)$ or $(x+4)(x-5)$ M1 for cancelling A1 cao
9	$x = 0.0 \dot{n}$ $10x = 0.\dot{n}$ $100x = n.\dot{n}$ $90x = n.\dot{n} - 0.\dot{n} = n$	Proof	3	B1 for either $10x = 0.\dot{n}$ or $100x = n.\dot{n}$ M1 for $100x - 10x = n.\dot{n} - 0.\dot{n} = n$ A1 for completing the proof

# **GCSE Mathematics mock papers**

**2381 (Modular)**

**Unit 3**

**Number, Algebra and Shape, Space and  
Measures 2**





# GCSE Mathematics 2381 Unit 3 Foundation mark schemes

## Section A

Number	Working	Answer	Mark	Notes
1 (a)	273 – 121	152	2	M1 for 273 – 121 A1 cao
(b)	$7.50 + 2 \times 4.20$ $20 - "15.90"$	4.10	3	M1 for $7.50 + 2 \times 4.20$ M1 for $20 - "15.90"$ A1 cao
(c)		20 10	2	M1 for evidence of adding 1 hour 40 minutes to 18 30 A1 cao
2 (a)		<i>C</i>	1	B1 cao
(b)		<i>E</i>	1	B1 cao
(c)		<i>B</i> and <i>D</i>	2	B1 for <i>B</i> B1 for <i>D</i>
3(a)		$\frac{47}{100}$	1	B1 cao
(b)		52%	1	B1 cao
(c)		25%	1	B1 cao
4 (a)		7.2	1	B1 cao
(b)		65°	1	B1 cao
(c)		<i>AB</i> and <i>DC</i> marked	1	B1 for a correct pair
5(a) i		973	2	B1 cao
ii		795		B1 cao
(b)		Kamloop	1	B1 cao
(c)		Vancouver	1	B1 cao

Number	Working	Answer	Mark	Notes
6 (a)		Isosceles	1	B1 cao
6 (b)		$A$	1	B1 cao
6 (c)		$B$ and $D$	1	B1 cao
7 (a)		0.064	1	B1 cao
7 (b)		25000	2	M1 for $5 \times 5$ or $10 \times 10 \times 10$ A1 cao
8 (a)		3	1	B1 cao
8 (b)		5	1	B1 cao
9		6	1	B1 cao
	$24 \div 6 \times 3$	18	2	M1 for $24 \div 4$ or 6 A1 cao
10		4	2	M1 for 20 seen A1 cao
11		10	2	M1 for $3 \times 6 - 8$ A1 cao
12		Net	2	B2 for correct net (B1 for 3 rectangles or two right angled triangles within a net)
13 (a)		1 : 5	1	B1 cao
13 (b)		$1 \frac{1}{3}$	1	B1 cao
14		Correct rotation	2	B2 for correct rotation (B1 for triangle of correct orientation but wrong position)
15		Diagram	3	B1 for bearing of $140^\circ \pm 2^\circ$ from Blackport B1 for bearing of $200^\circ \pm 2^\circ$ from Clancy Bay B1 for $\times$ within guidelines

Number	Working	Answer	Mark	Notes
16	$3y = 7 - 5x$ $y = \frac{7 - 5x}{3}$	$y = \frac{7 - 5x}{3}$	2	M1 for $3y = 7 - 5x$ A1 cao
17	$\frac{20}{100} \times 350$	70	2	M1 for $\frac{20}{100} \times 350$ oe A1 cao
18	$360 \div 40$	9	2	M1 for $360 \div 40$ A1 cao
19 (a)		16	1	B1 cao
(b)	$3 \times 16 \text{ or } 16 \div (20 \div 60)$	48	2	M1 for $3 \times 16$ A1 cao
(c)		Diagram	2	M1 for straight line with negative gradient A1 for line starting at (50,16) and finishing at (65,0)
20 (a)			2	B2 (B1 for one square missing or extra)
(b)			2	B2 (B1 for one square missing or extra)

## Section B

Number	Working	Answer	Mark	Notes
1 (a)		2 lines of symmetry	2	B2 for both lines of symmetry correct (B1 for 1 line correct)
(b)		Shape reflected	2	B2 for fully correct reflection (B1 for any line correctly reflected)
2	$3 \times 5.65$ $5.40 \div 4$ $7.20 + 16.95 + 5.40$	16.95, 1.35, 29.55	3	B1 for 16.95 B1 for 1.35 B1 ft for 29.55
3 (a)		Cylinder	2	B1 cao
(b)		Sphere	2	B1 cao
4	$\frac{50}{350}$	$\frac{1}{7}$	2	M1 for $\frac{50}{350}$ oe A1 cao
5 (a) i		3	5	B1 cao
ii		-11		B1 cao
(b) i		3		B1 for 3 or -3
ii		2		B1 for 2 or -2
(c)		-3		B1 cao



Number	Working	Answer	Mark	Notes
6 (a)	$3810 - 3540 = 270$ $270 \times 36 = 9720$	97.20	4	M1 for $3810 - 3540 (=270)$ M1 for “270” $\times 36$ A1 for “9720” $\div 100$ A1 for 97.20
(b)	$37.60 \div 40$	94p or £0.94	3	M1 for $37.60 \div 4$ A1 for digits 94 A1 for correct units with answer
7 (a)		6.5 cm	1	B1 for 6.3 – 6.7
(b)		Circle	1	B1 for circle drawn within guidelines
(c)		13cm	1	B1 ft from (a) <b>or</b> 12.6 – 13.4
8	$84 \div 9 (=9.33333)$ “9.3333” $\times 6$	56	3	M1 for $84 \div 9$ M1 for “9.3333” $\times 3$ A1 cao
9	$\frac{20}{100} \times 700 (=140)$ $700 + 140$	840	3	M1 for $\frac{20}{100} \times 700 (=140)$ oe M1 for $700 + “140”$ A1 cao
10 i	$180 - 34 (=146)$ “146” $\div 2$	73	3	M1 for $(180 - 34) \div 2$ A1 cao
ii		Reason		B1 for ‘angles in a triangle add to 180° and isosceles triangle’
11	$1.5 \times 40 + 20$	80	2	M1 for $1.5 \times 40 + 20$ A1 cao

Number	Working	Answer	Mark	Notes
12 (a)		10	3	B1 cao
(b)		11		B1 cao
(c)		4.5		B1 cao
13		Enlargement	2	B2 for correctly enlarged shape (B1 for any two lines correct length)
14 (a)		6.5	1	B1 cao
(b)	$4y = 9 - 2$	$\frac{7}{4}$ oe	2	M1 for $4y = 9 - 2$ A1
(c)	$4w + 3 = 2w + 10$ $4w - 2w = 10 - 3$ $2w = 7$	3.5 oe	3	M1 for $4w + 3 = 2w + 10$ M1 for $4w - 2w = 10 - 3$ A1
15	$3 + 5 = 8$ $24.80 \div "8"$ $"3.10" \times 2$	6.20	3	M1 for $24.80 \div (3+5)$ (=3.10) M1 for $3.10 \times 5$ or $3.10 \times 3$ or $3.10 \times 2$ A1 cao
16	$\pi \times 5^2$	78.5 cm <sup>2</sup>	3	M1 for $\pi \times 5^2$ A1 cao B1 for cm <sup>2</sup>
17 (a) i		$x^7$	2	B1 cao
ii		$y^4$		B1 cao
(b)		Explanation	1	B1 for 'no equals sign' or 'it is an expression' oe
18	$AC^2 = 6^2 + 10^2$ $\sqrt{36+100}$	11.7	3	M1 for $6^2 + 10^2$ M1 for $\sqrt{36+100}$ A1 cao

# GCSE Mathematics 2381 Unit 3 Higher mark schemes

## Section A

Number	Working	Answer	Mark	Notes
1 (a)		$\frac{1}{9}$	1	BI
(b)	$35 \div 7 = 5$ $5 \times 3 = 15$	15	2	M1 for $35 \div 7$ or 5 seen AI cao
(c)	$3 \div 8$	0.375	2	M1 for a valid attempt to divide 3 by 8 or 0.3... seen AI cao
2	$2 + 3 = 5$ $= 5 \frac{7+20}{28}$	$5 \frac{27}{28}$	3	M1 for common denominator of 28 M1 dep for one numerator correct or $\frac{27}{28}$ seen AI cao
3(a)	$5x - 3x = -7 - 2$ $2x = -9$ $x = -4.5$	-4.5	3	M1 for $5x - 3x = -7 - 2$ oe M1 for "correct simplification" AI for -4.5 oe
(b)	$y - 3 = 11 \times 4$ $y - 3 = 44$	47	2	M1 $y - 3 = 11 \times 4$ AI cao
4	$24 \div 6 = 4$ $4 \times 4$	16	2	M1 for $24 \div 6$ or 4 seen AI cao

Number	Working	Answer	Mark	Notes
5 (a)		16	1	B1
(b)	“16” ÷ (20 ÷ 60)	48	2	M1 for “16” ÷ “time” A1 cao
(c)		Line to 65	2	B2 for straight line from (50, 16) to (65, 0) (B1 for straight line from (50,16) to time axis)
6		Correct <i>P</i>	3	B1 for line 140° from Blackport ±2° B1 for line 200° from Clancy Bay ±2° B1 for correct position
7	$3y = 7 - 5x$	$\frac{7-5x}{3}$	2	M1 for $3y = 7 - 5x$ oe A1 for $\frac{7-5x}{3}$ oe
8 (a)		$x \geq -1$	2	B2 (B1 for $x \leq -1$ or $x > -1$ )
(b)		-2, -1, 0, 1, 2	2	B2 (B1 for 1 omission or 1 extra)
9 (a)		$9^{15}$	1	B1
(b)		$7^{21}$	1	B1
10(a)			2	B2 (B1 for one square missing or extra)
(b)			2	B2 (B1 for one square missing or extra)

Number	Working	Answer	Mark	Notes
11		rotation $180^\circ$ centre (0, 0)	3	M1 for rotation or 2 correct reflections on diagram (ignore labels) M1 (dep) for $180^\circ$ or correct centre A1 cao
12	(i)	$(x+11)(x-3)$	3	B2 for $(x+11)(x-3)$ (B1 for $(x\pm 11)(x\pm 3)$ B1 f.
13	(ii)	3 or -11	2	B1 for 34
14		34 reason explanation	2	B1 for angle t centre = $2 \times$ angle at circumference oe B2 for if $n = \text{odd}$ , then $n^3 = \text{odd}$ , and odd + odd = even if $n = \text{even}$ , then $n^3 = \text{even}$ , and even + even = even oe (B1 for less clear explanation or substituting at least 3 different values to show it is true)
15 (a)		$-\frac{3}{5}$	2	B2 oe (B1 for $\frac{3}{5}$ oe or $-\frac{5}{3}$ oe)
(b)		4	1	B1 for 4 oe
(c)		$y = 6x + 5$	2	M1 for $6x + c$ or $ax + 5$ A1 cao
16 i	i	$\frac{1}{36}$	1	B1
ii		9	2	M1 for $3^2$ A1 cao

Number	Working	Answer	Mark	Notes
17	$\frac{6+\sqrt{8}}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}}$ $= \frac{6\sqrt{2} + \sqrt{8}\sqrt{2}}{2}$ $= \frac{6\sqrt{2} + 4}{2}$	$3\sqrt{2} + 2$	3	<p>M1 for <math>\frac{\sqrt{2}}{\sqrt{2}}</math></p> <p>M1 for <math>\frac{6\sqrt{2} + \sqrt{8}\sqrt{2}}{2}</math> oe</p> <p>A1 cao (accept <math>p = 3, q = 2</math>)</p>
18	<p>Let <math>BP = x</math>   <math>AP = 4x</math></p> <p><math>AB = 5x</math>   <math>BC = 3x</math></p> <p><math>AC^2 = (5x)^2 - (3x)^2</math></p> <p><math>AC = 4x</math></p> <p><math>\sin B = \frac{4x}{5x} = \frac{4}{5}</math></p>	Proof	4	<p>M1 for <math>AB = 5x</math> or <math>BC = 3x</math></p> <p>M1 for correct use of Pythagoras</p> <p>A1 for <math>AC = 4x</math></p> <p>B1 for <math>\sin B = \frac{4x}{5x}</math></p>

## Section B

Number	Working	Answer	Mark	Notes
1		Reflection	2	B2 (B1 for 2 lines in correct position)
2	$24.8 \div 8 = 3.1$ $3 \times 3.1 = 9.3$ $5 \times 3.1 = 15.5$ $15.5 - 9.3$	6.20	3	M1 for $24.8 \div 8$ or 3.1 seen A1 for 9.3 or 15.5 B1 for 6.20
3	$\pi(5)^2$	78.5 cm <sup>2</sup>	3	M1 for $\pi(5)^2$ oe A1 for answer that rounds to 78.5 B1 (indep) for cm <sup>2</sup>
4		$C = 5a + 2f$	3	B3 for $C = 5a + 2f$ oe (B2 for $5a + 2f$ B1 for $C =$ an expression in $a$ and $b$ or $5a$ oe or $2f$ oe seen)
5	$\frac{20}{120}$	$1 \frac{1}{6}$	2	M1 for converting both to the same units A1 cao
6		Rotation	2	B2 for correct rotation (B1 for correct orientation or 90° clockwise rotation)
7 (a) i		$x^{12}$ $y^4$	2	B1 B1
ii		reason	1	B1 for no equal sign or it is an expression
(b)				

Number	Working	Answer	Mark	Notes
8	$x + 7 + x + 7 + 2x - 1 = 27$ $4x + 13 = 27$ $4x = 27 - 13 = 14$ $x = 3.5$ Largest side = $3.5 + 7$	10.5	4	M1 for $x + 7 + x + 7 + 2x - 1 = 27$ oe M1 for correctly rearranging 'equation' with $x$ terms on one side and rest on other side (accept use of only 2 sides) A1 for 3.5 oe B1 ft (dep on M1) for ' $3.5$ ' + $7$
9	$360 \div 40$	9	2	M1 for $360 \div 40$ or other valid method to reach 9 A1 cao
10 (a)		9, 3, 3	2	B2 (B1 for 1 correct)
(b)		graph	2	M1 for plotting at least 4 points correctly and joining with a curve or plotting all correct points but not joined with a curve A1 cao
11	4 ... 124    5 ... 245 4.6 ... 190    4.7 ... 203 4.65 ... 196	4.7	4	M1 for correct trial between 4 and 5 inclusive M1 for further correct trial between 4 and 5 exclusive M1 for trial of 4.65 A1 cao
12 (a)		circle radius 3 cm	1	B1 for circle radius $3 \text{ cm} \pm 0.2 \text{ cm}$
(b)		bisect the angle	2	M1 for arc drawn centre $O$ cutting $OA$ and $OB$ or line from $O$ bisecting the angle $\pm 4^\circ$ A1 for accurate bisector $\pm 2^\circ$

Number	Working	Answer	Mark	Notes
13	$(1.05)^3 \times 6000$ or $5 \div 100 \times 6000 = 300$ Total 6300 $5 \div 100 \times 6300 = 315$ Total 6615 $5 \div 100 \times 6615 = 330.75$	6945.75	3	B1 for $(1.05)^3$ M1 for $(1.05)^3 \times 6000$ A1 cao or M1 for $5 \div 100 \times 6000 + 6000$ or 6300 seen M1 for $5 \div 100 \times '6300' + '6300'$ and $5 \div 100 \times '6615' + '6615'$ A1 cao
14	$\frac{580.09... - 2.03...}{13.35} = \frac{578.06...}{13.35}$	43.3006069	2	B2 for answer that rounds to 43.3 (B1 for 578... or 580.09.. or 2.03... seen)
15		$2b(3a + c)$ $\frac{ac^2}{b}$ $3a^2$	3	B1 B1 B1
16	$100 \div 80 \times 7.60$	34.50	3	B1 for 80 or 0.8 seen M1 for $100 \div 80 \times 7.60$ oe A1 cao
17 (a)	$24.5 \times 6.5$	159.25	2	B2 cao (B1 for $24.5 \times x$ or $6.5 \times x$ ) (accept 24.49999 or 6.49999 oe)
(b)	$23.5 \div 6.5$	3.615384615	2	B2 for 3.615 or better (B1 for $23.5 \div 6.5$ or $23.5 \div 6.49999$ oe)

Number	Working	Answer	Mark	Notes
18	$\begin{aligned} \text{Area sector} &= 80 \div 360 \times \pi(6.2)^2 \\ &= 26.83618\dots \\ \text{Area triangle} &= 0.5 \times 6.2 \times 6.2 \times \sin 80^\circ \\ &= 18.928\dots \\ 26.836 - 18.928 &= 7.908 \end{aligned}$	7.91	5	M1 for $80 \div 360 \times \pi(6.2)^2$ or 26.83... seen M1 for $0.5 \times 6.2 \times 6.2 \times \sin 80^\circ$ or 18.92... seen M1 for 26.83... or 18.92... seen M1 for 'area sector' – 'area triangle' A1 for answer that rounds to 7.91
19	$\begin{aligned} 4x^2 &= 11x + 3 \\ 4x^2 - 11x - 3 &= 0 \\ (4x + 1)(x - 3) &= 0 \\ x &= -\frac{1}{4} \text{ or } 3 \\ y &= \frac{1}{4} \text{ or } 36 \end{aligned}$	$\begin{aligned} x &= -\frac{1}{4} \\ y &= 36 \\ x &= 3 \\ y &= \frac{1}{4} \end{aligned}$	5	B1 for $4x^2 = 11x + 3$ oe M1 for $(4x \pm 1)(x \pm 3)$ A1 for $x = -\frac{1}{4}$ or 3 M1 for substitution to get $y$ A1 for $y = \frac{1}{4}$ or 36

# 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 it is clear from the working that the “correct” answer has been obtained from incorrect working, award 0 marks.

Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks.

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 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.

If there is no answer on the answer line then check the working for an obvious answer.

## 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: eg incorrect cancelling 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, eg 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 as 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.

Further copies of this publication are available from  
Edexcel Publications, Adamsway, Mansfield, Notts, NG18 4FN

Telephone 01623 467467  
Fax 01623 450481  
Email: [publications@linneydirect.com](mailto:publications@linneydirect.com)

Publications Code UG019581 January 2008

For more information on Edexcel and BTEC qualifications please contact  
Customer Services on 0870 240 9800  
or <http://enquiries.edexcel.org.uk>  
or visit our website: [www.edexcel.org.uk](http://www.edexcel.org.uk)

Edexcel Limited. Registered in England and Wales No. 4496750  
Registered Office: One90 High Holborn, London WC1V 7BH. VAT Reg No 780 0898 07