

GCSE Mathematics Mark scheme  
June 2006  
1387 (Linear)

## Contents

1	Notes on Marking Principles	2 - 3
2	Paper 5521/01 Mark Scheme	4 - 8
3	Paper 5521/02 Mark Scheme	9 - 13
4	Paper 5523/03 Mark Scheme	14 - 19
5	Paper 5523/04 Mark Scheme	20 - 25
6	Paper 5525/05 Mark Scheme	26 - 32
7	Paper 5525/06 Mark Scheme	33 - 39

## 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. Send the response to review, and discuss each of these situations with your Team Leader.  
Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks. Discuss each of these situations with your Team Leader.  
If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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.

Paper 5521_01				
No	Working	Answer	Mark	Notes
1	(a)	Line 6cm long	1	B1 for line 6 cm $\pm$ 0.2cm
	(b)	Point 2cm from A	1	B1 for point 2 cm $\pm$ 0.2cm from A
2	33 – 19 = 14 14 + 15	29	2	M1 for 33 – 19 or 33 + 15 or 19 – 15 or 14 seen or 48 seen or 4 seen  A1 cao
3	(a)(i)	0.25	2	B1 0.25
	(ii)	$\frac{1}{4}$		B1 cao
	(b)(i)	2	2	B1 cao
	(ii)	6		B1 cao
4	(a)	12	1	B1 cao
	(b)	3	2	M1 for 5 seen or 4 – 1 A1 cao
	(c)	5 circles $3\frac{1}{2}$ circles	2	B1 cao B1 cao
5	(a)	23	1	B1 cao
	(b)	31	1	B1 cao
6	(a)	16 cm <sup>2</sup>	2	B1 for 16 B1 (indep) for cm <sup>2</sup>
	(b)	18	1	B1 cao
	(c)	10	2	B2 for 10 (B1 for 9 or 11 or 5 $\times$ 2 or evidence of length $\times$ width height eg 2 $\times$ 3 $\times$ 1, 2 $\times$ 3 $\times$ 2)

Paper 5521_01				
No	Working	Answer	Mark	Notes
7	(a)	Five thousand and sixty seven	1	B1 cao (accept 5) condone omission of "and"
	(b)	1400	1	B1 cao
8	(a)	4539	1	B1 cao
	(b)	Chicago	1	B1 cao
	(c)	Boston	1	B1 cao
9		A	1	B1 cao
10	(a)	150	1	B1 for $150 \pm 3$
	(b)	70	1	B1 for $70 \pm 3$ or $220 - (a)$ ft
11	(a)	correct reflection	1	B1 cao
	(b)	correct reflection	1	B1 cao
12	(a)(i)	(2, 6)	2	B1 cao
	(ii)	(0, 4)		B1 cao
	(b)(i)	P correct	2	B1 cao
	(ii)	Q correct		B1 cao
13	(i)	10	3	B1 cao
	(ii)	0		B1 cao
	(iii)	2		B1 cao
14	(a)	-2	1	B1 cao
	(b)	$7 - -5$ or $-5 - 7$	2	M1 for $7 - -5$ or $-5 - 7$ A1 cao (accept -12)
	(c)	1	1	B1 cao (accept +1)

Paper 5521_01				
No	Working	Answer	Mark	Notes
15	(a)	55(%)	1	B1 cao
	(b)	0.09	1	B1 cao
	(c)	36	2	M1 for $9 \div 100 \times 400$ oe eg $4 \times 9$ A1 cao
16	(i)	S extreme left	3	B1 cao
	(ii)	H middle		B1
	(iii)	M extreme right		B1
17	(a)	$3g$	1	B1 cao
	(b)	$p^2$	1	B1 cao
18		Construction	4	B4 for fully correct quadrilateral (B3 for 3 measurements correct B2 for 2 measurements correct B1 for 1 measurement correct )
		Angle $A = 90^\circ \pm 2^\circ$ Angle $B = 120^\circ \pm 2^\circ$ $AD = 5\text{cm} \pm 0.2\text{ cm}$ $BC = 4\text{cm} \pm 0.2\text{ cm}$		
19	(a)	$D$ or $A$	1	B1
	(b)	130	2	M1 for $180 - 50$ or $50 + 130 = 180$ or $360 - 180 - 50$ A1 cao
20	(a)	1485	2	M1 for a fully correct method, (condone one arithmetic error) A1 cao
	(b)	300	2	M1 for $1200 \div 4$ A1 cao

Paper 5521_01				
No	Working	Answer	Mark	Notes
21	(a) 16 55 – 17 00 is 5min 17 00 – 19 45 is 2 45 120 + 45 + 5	170	3	M1 for an attempt to partition, eg sight of 5, 2 45, 10, -10, 50, 165 or 60,60,45  A1 for 60+60+50, 2h50(min), 5 and 2h45(min) or 3h and -10 2-50, 2.50, 2 50 (not 250 or 2.5)  A1 cao
	(b)(i)	80		B1 cao
	(ii) 800 ÷ 8 = 100 3 × 100 = 300	300	4	M1 for 800 ÷ 8 or 800 × 3 or 100 seen or 2400 seen  A1 cao B1 ft
	(iii) 800 – (“80” + “300”)	420		
	(c) $\frac{320}{800} \times 100$	40	2	M1 for $\frac{320}{800}$ (oe)  A1 cao
22	(a) $2 \times -5 + 3 \times 5$	7	2	M1 for $2 \times -4$ or $-4 - 4$ or $3 \times 5$ or $5+5+5$ or $-8$ or $15$  A1 cao
	(b) $40 = 2m + 30$	5	2	M1 for $40 = 2m + 30$ or $40 = 2 \times 5 + 30$ or $40 = 10 + 30$ or $2m = 10$  A1 cao
23	$10 \times 8 = 80$ $4 \times 2 = 8$  $80 - 3 \times 8$	56	3	M1 for $10 \times 8$ or 80 M1 for $4 \times 2$ or 8 or $8 \times 3$ or 24; (NB 8 not the rectangle width)  A1 cao

Paper 5521_01									
No	Working					Answer	Mark	Notes	
24		<b>SL</b>	<b>PL</b>	<b>O</b>	<b>T</b>	See working	3	B3 for all correct  (B2 for 4 or 5 correct B1 for 2 or 3 correct)	
	<b>F</b>	21	<b>13</b>	13	47				
	<b>M</b>	<b>19</b>	5	<b>14</b>	38				
	<b>T</b>	40	<b>18</b>	<b>27</b>	85				
25	(a)						87.38	1	B1 cao
	(b)						340	1	B1 cao
26	(a)	$2x + 2x + 10$					$4x + 10$	2	B2 for $4x + 10$ (B1 for $2x + 2x + 10$ oe)
	(b)	$4x + 10 = 34$					6	2	M1 for " $4x + 10$ " = 34 or $34 - 10 \div 4$ A1 cao
27	(a)						Overlay	3	B3 fully correct (B2 correct orientation in correct quadrant) (B1 any rotation about O; or correct orientation in incorrect quadrant).
	(b)						Translation	1	B1 cao
28	(a)						No time period	2	B1 No time period
	(b)						Labels too vague Not enough people Teachers not representative	2	B1 Labels too vague B1 Not enough people B1 Teachers not representative
29	(a)	$4x = 16$					4	2	M1 for $4x = 19 - 3$ oe or $19 - 3 \div 4$ A1 cao
	(b)	$4y - 2y = 8 - 1$					3.5	2	M1 for $4y - 2y = 8 - 1$ A1 cao
30			$\frac{10}{15} + \frac{3}{15}$			$\frac{13}{15}$ oe	2	M1 for suitable common denominator (multiple of 15), at least one of two fractions correct.  A1 for $\frac{13}{15}$ oe	

Paper 5521_02				
No	Working	Answer	Mark	Notes
1	(a)	1.30	1	B1cao
	(b)	1.05	1	B1cao
2	(a)	27.5	1	B1 accept 27½
	(b)	11	1	B1 cao
3	(a)	27	1	B1 ignore any units
	(b)	3.2	1	B1 ignore any units
	(c)	460 marked	1	B1 for arrow between 455 and 465 inclusive
	(d)	2.8 marked	1	B1 for arrow between 2.75 and 2.85 inclusive
4	(a)	>> marked	1	B1 (accept one arrow)
	(b)	Acute angle marked with <i>A</i>	1	B1
	(c)	Reflex angle marked with <i>R</i>	1	B1
	(d)	52	1	B1 ± 2°
5	(i)	cone	1	B1 ignore spellings
	(ii)	cuboid	1	B1 ignore spellings
6	(a)	2	1	B1 cao
	(b)	Wednesday	1	B1 cao (ignore spellings, accept abbreviations)
	(c)(i)	Robin 4+5 = 9	1	B1 cao
	(c)(ii)	Helen 3+8 = 11 Helen watched 2 hours more	2	B1 for sight if 3 and 8 or 11 B1 for Helen

Paper 5521_02				
No	Working	Answer	Mark	Notes
7	(a)	8 cm	1	B1 $\pm$ 2mm
	(b)		1	B1 $\pm$ 2mm use overlay
	(c)		1	B1 for all parts within $\pm$ 2mm, use overlay
8	(a)	75p + £1.70	1	B1 cao
	(b)	$2 \times 75p + 1.35$	2	M1 for $2 \times 75p + £1.35$ or digits 285 seen A1 for 2.85 (SC B1 for 2.10 or 210p )
	(c)	£5 – (85p+£1.70) £5 – £2.55	2	M1 for £5 – (85p+£1.70) or digits 245 seen (ignore units) A1 cao (SC B1 for £5 – “total” correctly calculated)
9	(a)	1,1,4,6,3,3,2	2	B2 for all frequencies correct (B1 for 5 or 6 frequencies correct or all tallies correct)
	(b)	5	1	B1 ft from (a)
	(c)	6	1	B1
10		$18 \div 20$ $= 0.9$	3	M1 for $18 \div 20$ or valid partitioning method , allow one arithmetic error. A1 for sight of 0.9 or 90 or 0.90 B1 ft for their cost of one litre correctly written as money (SC B1 for £1.11)
11	(i)	$2 \times £1.50$	1	B1 cao
	(ii)	$£5 \div 2$	1	B1 cao
	(iii)	$£16 \times 1\frac{1}{2}$	1	B1 cao
	(iv)	Total =	1	B1 ft from their results

Paper 5521_02				
No	Working	Answer	Mark	Notes
12	(a)(i)	0.1	1	B1 cao
	(ii)	10%	1	B1 cao
	(b)	12 squares shaded	1	B1 for any 12 squares shaded
13	(a)	A and D	2	B2 for both correct (B1 for 1 correct)
	(b)	B and C	2	B2 for both correct (B1 for 1 correct)
14	$\frac{3}{5} \times 20 + \frac{1}{10} \times 20 = 14$ or $\frac{12}{20} + \frac{2}{20} = \frac{14}{20}$ $20 - "14"$ or $1 - \frac{"14"}{20}$	6	3	M1 $20 \div 5 \times 3$ or $20 \div 10$ or 12 seen or 2 seen M1( dep )for 20 – “14” A1 cao (SC B2 for 14 seen) Alternative M1 for $\frac{12}{20} + \frac{2}{20}$ or sight of $\frac{7}{10}$ M1(dep ) for 1 $\frac{"14"}{20}$ or 1- $\frac{7}{10}$ or sight of $\frac{3}{10}$ A1cao
15	(a)	$3c$	1	B1
	(b)	$3e+2f$	1	B1
	(c)	$5a$	1	B1
	(d)	$4xy$	1	B1
	(e)	$2a+7b+8$	2	B2 for $2a + 7b+ 8$ (B1 for either 2a or 7b)
16	(a)	150	1	B1 for $150 \pm 5$
	(b)	It might have rained or they may have run out of ice-cream	1	B1 for valid reason

Paper 5521_02					
No	Working	Answer	Mark	Notes	
17	(a)	$200 \times 1.40$	280	2	M1 for $200 \times 1.40$ or 28000 seen A1 for 280 cao
	(b)	$10.64 \div 1.33$	8.00	2	M1 for $10.64 \div 1.33$ A1 for 8 or 8.0 or 8.00
18	(a)	$10 \times 4.50$	45	2	M1 for $10 \times 4.50$ A1 cao
	(b)	$66 \div 12$	5.50	2	M1 for $66 \div 12$ A1 for £5.50 accept 5.5
19	(a)	Picture of 4 arrowheads made from 18 matchsticks		1	B1 for any reasonable diagram
	(b)		18 22	2	B1 for 18 B1 for 22 (ft +4 on their 18)
20		$4.5 \times 2.5$	11.25	2	M1 for $4.5 \times 2.5$ or of digits 1125 A1 for 11.25
		$\sqrt{324}$	18	2	M1 for $\sqrt{324}$ A1 for 18
21	960 bricks in $\frac{960}{200}$ = 4.8 hours	4h 48min	3	M1 for $\frac{960}{200}$ or any valid partitioning method leading to 900 A1 for 4.8 seen A1 for 4 hours 48 mins cao (SC B2 for 4 hours 8 minutes or 4 hours 80 mins or B1 for 4 hours < answer < 5 hours)	
22	(a)(i)		$\frac{1}{6}$		B1 accept equivalent fractions, decimals, or percentages Accept 0.16 or better, 16% or better
	(ii)		$\frac{1}{2}$		B1 accept equivalent fractions, decimals or percentages
	(iii)		$\frac{1}{3}$		B1 accept equivalent fractions, decimals or percentages Accept 0.33 or better, 33% or better
	(iv)		0		B1 accept 0/6, zero, nought.
	(b)	Ken's dice is biased			B1 for dice is biased, unfair, weighted oe

Paper 5521_02					
No	Working	Answer	Mark	Notes	
23	(a)	$5 + 10 \times 4.50$	50	2	M1 for $10 \times 4.50$ or 45 seen A1 for 50
	(b)	$65 - 65 \div 5$	52	2	M1 for $65 \div 5$ oe or 13 seen A1 for 52
	(c)	$50 + \frac{17.5}{100} \times 50$	58.75	2	M1 for $\frac{17.5}{100} \times 50$ oe or 5, 2.5(0) and 1.25 seen or 8.75 seen or digits 5875 seen A1 for £58.75
24	(a)		2	1	B1 cao
	(b)		28	2	M1 for identifying the 16 <sup>th</sup> and 17 <sup>th</sup> values or sight of $(32+1) \div 2$ oe A1 cao
25	(a)	$3.14 \times 50 \times 50$	7854	2	M1 for $\pi \times 50 \times 50$ (accept $\pi$ as 3.1 or better) A1 for 7750 to 7860 or $2500\pi$ or $\pi 2500$
	(b)	$3.14 \times 40$	126	2	M1 for $\pi \times 40$ (accept $\pi$ as 3.1 or better) A1 for 124 to 126 or $40\pi$ or $40\pi$
26	(a)		Positive	1	B1 for positive
	(b)			1	B1 for correct line within (50, 50), (50, 60) and (10, 10), (10, 20) Do not accept line joining (10, 10) to (50, 50)
	(c)		approx 47	1	B1 ft for a single line segment with positive gradient $\pm 1$ full (2mm) square
27	(a)		218°	1	B1 $\pm 2^\circ$
	(b)			2	B1 for $320^\circ \pm 2^\circ$ use overlay B1 for 7 cm $\pm$ 2 mm use overlay
28		$380 \div 200 = 1.9$ $350 \div 175 = 2$	Rob, less pence per gram	2	M1 for $380 \div 200 (= 1.9)$ and $350 \div 175 (= 2)$ oe or $200 \div 380 (= 0.526)$ and $175 \div 350 (= 0.5)$ oe or valid complete method for comparing the two tubs A1 for Rob with correct calculations

Paper 5523_03										
No		Working				Answer	Mark	Notes		
1		<b>SL</b>	<b>PL</b>	<b>O</b>	<b>T</b>	See working	3	B3 for all correct B2 for 4 or 5 correct B1 for 2 or 3 correct		
	<b>F</b>	21	<b>13</b>	13	47					
	<b>M</b>	<b>19</b>	5	<b>14</b>	38					
	<b>T</b>	40	<b>18</b>	<b>27</b>	85					
2	(a)	$2 \times -4 + 3 \times 5$				7	2	M1 for $2 \times -4$ or $-4-4$ or $3 \times 5$ or $5+5+5$ or $-8$ or $15$ A1 cao		
	(b)	$40 = 2m + 30$				5	2	M1 for $40 = 2m + 30$ or $40 = 2x5 + 30$ or $40 = 10 + 30$ or $2m = 10$ A1 cao		
3	(a)	16 55 – 17 00 is 5min 1700 – 19 45 is 2 45 120 + 45				170	3	M1 for an attempt to partition, eg sight of 5 min, 2h 45 min, $\pm 10$ , 50 or 60,60,45 A1 for $60+60+50$ , 2h50(min) 5 and 2h45(min), 3h and -10 OR sight of 2-50, 2.50, 2 50 (not 250 or 2.5) A1 cao B1 cao		
	(b)(i)					80		B1 cao		
	(ii)	$800 \div 8 = 100$ $3 \times 100 = 300$				300	3	M1 for $800 \div 8$ or $800 \times 3$ or 100 seen or 2400 seen A1 cao B1 ft		
	(iii)	$800 - ("80" + "300")$				420				
	(c)	$\frac{320}{800} \times 100$				40	2	M1 for $\frac{320}{800}$ (oe) A1 cao		
4		$10 \times 8 = 80$ $4 \times 2 = 8$ $80 - 3 \times 8$				56	3	M1 for $10 \times 8$ or 80 M1 for $4 \times 2$ or 8 or $8 \times 3$ or 24; nb 8 not the rectangle width A1 cao		

Paper 5523_03					
No	Working	Answer	Mark	Notes	
5	(a)	$24 \times 2$	48	2	M1 for $24 \times 2$ or $24 \times 2 \times 100$ or $24 \times 200$ A1 cao
	(b)	$10 \div 2$	5	2	SC: 480, 4800 gets B1 M1 for $10 \div 2$ , or multiplication of a scale factor like 1:"50" A1 cao
6	(a)		87.38	1	B1 cao
	(b)		340	1	B1 cao
7		$\frac{10}{15} + \frac{3}{15}$	$\frac{13}{15}$ oe	2	M1 for suitable common denominator (multiple of 15), at least one of two fractions correct. A1 oe
8	(a)	$2x + 2x + 10$	$4x + 10$	2	B2 for $4x + 10$ (B1 for $2x + 2x + 10$ oe)
	(b)	$4x + 10 = 34$	6	2	M1 for ' $4x + 10$ ' = 34 or $34 - 10 \div 4$ A1 cao
9	(a)		$5^2 - 3^2 = 16$ $= 4 \times 4$ 480	1	B1 cao
	(b)	$120 \times 4$  $\begin{array}{r} 121 \quad 1071 \\ 2420 \quad 1190 \\ \hline 12100 \quad 11900 \\ 14641 \quad 14161 \end{array}$ Other methods are also permissible.		2	M1 for $4 \times 120$ or $2 \times 240$ A1 cao 480 Or M1 14641 – 14161 condone one arithmetic error A1 cao 480
10			Overlay	3	B3 fully correct (B2 correct orientation in correct quadrant) (B1 any rotation about O; correct orientation in incorrect quadrant).

Paper 5523_03				
No	Working	Answer	Mark	Notes
11	$1200 \div 4$	300 or 5 km/h km/min	3	M1 for $1200 \div 4$ or $1200 \div 240$ A1 cao B1(indep) units as km/h; accept kmph, kph, km per hour, km/ph or units as km/min.
12	(a) $4x = 16$	4	2	M1 for $4x = 19 - 3$ oe or $19 - 3 \div 4$ A1 cao
	(b) $4y - 2y = 8 - 1$	3.5	2	M1 for $4y - 2y = 8 - 1$ A1 cao
	(c) $2t + 10 + 13$	$2t + 23$	2	M1 for $2t + 10$ A1 cao
13	(a) $x^2 = \frac{108}{3}$	6	2	M1 $(x^2 =) \frac{108}{3}$ (=36) or 36 seen A1 cao 6 or -6 or both. Also accept $\sqrt{36}$
	(b) $2 \times 54 = 2 \times 2 \times 27$	$2 \times 2 \times 3 \times 3 \times 3$	3	M1 for attempt at continual prime factorisation ( at least 2 correct steps); could be shown as a factor tree. A1 all 5 correct prime factors and no others A1 $2 \times 2 \times 3 \times 3 \times 3$ or $2^2 \times 3^3$ oe
14	$10.5 \times 5$	52.5g	2	M1 $10.5 \times 5$ A1 cao
15	(a)	$120 < t \leq 160$	1	B1 correct interval eg 120-160
	(b)	$\frac{26}{60}$	2	M1 $(16 + 10) \div '60'$ or 26 seen or $\frac{16}{60}$ A1 oe

Paper 5523_03														
No	Working	Answer	Mark	Notes										
16	(a)	5, -1, 1	2	B2 all three correct (B1 one or two correct)										
	(b)		2	B1ft points plotted correctly $\pm 1$ full square at least 6 points. B1 smooth curve through their plotted points provided at least B1 awarded in (a).										
	(c)	3.6, -0.6	2	B2 for $x= 3.4$ to $3.8$ and $-0.8$ to $-0.4$ otherwise ft $\pm 1$ full square depend on at least B1 in (b) (B1 for one value or line $y= 3$ seen)										
17	(a)	126.5g	1	B1 cao										
	(b)	127.5g	1	B1 127.5 or 127.49 or 127.49... or 127.499										
18		overlay	4	M1 Quarter "circle" drawn centre A inside rectangle (ignore lines outside the rectangle) A1 radius 4 cm $\pm 2$ mm B1 line drawn 1 cm $\pm 2$ mm from DC. B1 ft (dep on two loci attempts drawn) region shaded										
19	(a)	No time period Labels too vague	2	B1 No time period B1 Labels too vague										
	(b)	How many pizzas have you eaten in the last week? <table border="1" style="margin-left: 20px;"> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>More than 3</td> </tr> </table>						0	1	2	3	More than 3	2	B1 Include a time period B1 At least 3 numeric response boxes
0	1	2	3	More than 3										
20		$\frac{400 \times 6}{0.2} = \frac{2400}{0.2}$	3	M1 two of 400, 6, 0.2 A1 $\frac{2400}{0.2}$ , or $\frac{2460}{0.2}$ or $2000 \times 6$ or $2050 \times 6$ or $400 \times 30$ or $410 \times 30$ A1										

Paper 5523_03				
No	Working	Answer	Mark	Notes
21	(a)	$4.56 \times 10^5$	1	B1 cao
	(b)	$3.4 \times 10^{-4}$	1	B1 cao
	(c)	$1.6 \times 10^8$	1	B1 cao
22	(a)	$(x+2)(x+4)$	2	M1 $(x \pm 2)(x \pm 4)$ A1 cao
	(b)	-2, -4	1	B1 ft from (a) or -2, -4
23	(a)	He has taken it from this year instead of last year	1	B1 Reason or appropriate calculation
	(b)	$\frac{240}{1.2}$	2	M1 $\frac{240}{1.2}$ oe A1 cao
24	(a)	SF = 1.5	2	M1 SF = $\frac{12}{8}$ , $\frac{8}{12}$ , 1.5, 0.6 ... oe A1 cao
	(b)	$45 \times \frac{8}{12}$	2	M1 $45 \times \frac{8}{12}$ , $45 \div \frac{12}{8}$ oe A1 cao
25	(a)	12, 33, 69, 92, 100	1	B1 cao
	(b)		2	B1 ft for 4 or 5 points plotted correctly $\pm 1$ full 2 mm square at the end of interval dep on sensible table ( condone one addition error) B1 dep for points joined by curve or line segments provided no gradient is negative . Ignore any point of graph outside range of their points. SC B1 if 4 or 5 points plotted not at end but consistent within each interval and joined .
	(c)	62- 64	1	B1 62-64 otherwise ft from cumulative freq graph

Paper 5523_03				
No	Working	Answer	Mark	Notes
26	(a)	$x = 3, y = 2$	1	B1 cao
	(b)	(4,2), (5,1) (5,2), (5,3)	3	B3 all correct and none incorrect B2 at least 2 correct and not more than 4 points. B1 line $x=6$ drawn or B1 one point correct
27	(a)	$90^\circ$	2	B1 cao B1 angle in semi circle ( $= 90^\circ$ )
	(b)	$70 \div 2$	2	B1 $35^\circ$ or $325^\circ$ B1 angle at centre = twice angle at circumference OR B1 angle on a straight line <i>with</i> isosceles triangle

Paper 5523_04				
No	Working	Answer	Mark	Notes
1	P marked at top left and bottom		2	B2 for both correct (B1 for one correct) (-B1 each error if more than 2 Ps)
2	(a) $4.5 \times 2.5$	11.25	2	M1 for $4.5 \times 2.5$ or sight of digits 1125 A1 for 11.25
	(b) $\sqrt{324}$	18	2	M1 for $\sqrt{324}$ A1 for 18
3	(a)	150	1	B1 for $150 \pm 5$
	(b) It might have rained or they may have run out of ice-cream		1	B1 for valid reason
4	(a)	$3e + 2f$	1	B1
	(b)	$4xy$	1	B1
	(c)	$2a + 7b + 8$	2	B2 for $2a + 7b + 8$ (B1 for either $2a$ or $7b$ )
5	(a) $5 + 10 \times 4.50$	50	2	M1 for $10 \times 4.50$ or 45 seen A1 for 50
	(b) $65 - \frac{65}{5}$	52	2	M1 for $65 \div 5$ oe or 13 seen A1 for 52
	(c) $50 + \frac{17.5}{100} \times 50$	58.75	2	M1 for $\frac{17.5}{100} \times 50$ oe or 5, 2.5(0) and 1.25 seen or 8.75 seen or digits 5875 A1 for 58.75
6		22 $4n + 2$	3	B1 for 22 B2 for $4n + 2$ oe ( B1 for $4n \pm k$ , $k \neq 2$ )

No	Working	Answer	Mark	Notes
7	960 bricks in $\frac{960}{200}$ = 4.8 hours	4 hr 48 min	3	M1 for $\frac{960}{200}$ or valid partitioning method leading to 900 A1 for 4.8 seen A1 for 4 hours 48 mins cao (SC: B2 for 4 hours 8 minutes or 4 hours 80 minutes B1 for 4 hours < answer < 5 hours)
8	(a) $200 \times 1.40$ (b) $10.64 \div 1.33$ (c) $1.40 - 1.33 = 0.07$ "0.07" $\div 1.40 \times 100$	280 8.00 5%	2 2 3	M1 for $200 \times 1.40$ or 28000 seen A1 for 280 cao M1 for $10.64 \div 1.33$ A1 for 8 cao M1 for $1.40 - 1.33$ or 0.07 M1 (dep) for "0.07" $\div 1.40 \times 100$ A1 cao Or M1 for $\frac{1.33}{1.40} \times 100$ M1(dep) for 100 - "95" A1 cao
9	(a) (b)	2 28	1 2	B1 cao M1 for identifying 16 <sup>th</sup> and 17 <sup>th</sup> or sight of $(32 + 1) \div 2$ oe A1 cao
10	(a) $3.14 \times 50 \times 50$ (b) $3.14 \times 40$	7854 126	2 2	M1 for $\pi \times 50 \times 50$ (accept $\pi$ as 3.1 or better) A1 for 7750 to 7860 or $2500\pi$ M1 for $\pi \times 40$ (accept $\pi$ as 3.1 or better) A1 for 124 to 126 or $40\pi$

Paper 5523_04				
No	Working	Answer	Mark	Notes
11	(a)	Positive	1	B1 for positive
	(b)		1	B1 for correct line within (50, 50), (50, 60), (10,10), (10,20) Do not accept line joining (10,10) to (50,50)
	(c)	Approx 47	1	B1 ft from single line segment with positive gradient $\pm 1$ full (2 mm) square.
12	$380 \div 200 = 1.9$ $350 \div 175 = 2$	Rob, less pence per gram	2	M1 for $380 \div 200 (= 1.9)$ and $350 \div 175(=2)$ oe or $200 \div 380 (=0.526)$ and $175 \div 350 (=0.5)$ oe or for any valid complete method for comparing the two tubs A1 for Rob with correct calculations
13	(a)	80	2	M1 for $10 + 10 \times 7$ A1 for 80 cao
	(b)	29.5	2	M1 for $-2.5 + 10 \times 3.2$ A1 for 29.5
14	(a)		2	B2 for correct triangle with arcs (B1 for correct triangle; no arcs)
	(b)		2	M1 for two pairs of correct intersecting arcs A1 for correct perpendicular bisector SC if no marks, B1 for line within guidelines
15	$2 \times 2.50 + 3 \times 1.25 = 8.75$ "8.75"-6.50	2.25	4	M1 for $2 \times 2.50$ or $3 \times 1.25$ A1 for 8.75 M1(dep on 1 <sup>st</sup> M1) for "8.75"-6.50 A1 ft for 2.25
16	No because when $n = 6$ $6n - 1 (= 35)$ is not prime		2	B2 for correctly showing that when $n = 6$ 35 is obtained and identified oe (B1 for correctly evaluating $6n - 1$ for at least 3 different whole number values of $n$ or for 35 oe with no working)

Paper 5523_04				
No	Working	Answer	Mark	Notes
17	$3\% = 0.72$ $1\% = 0.24$ $100\% = 24$ $103\% = 24.72$	24.72	3	M1 for $3\% = 0.72$ or $0.03x = 0.72$ M1 for $1\% = 0.24$ oe or 24 or $0.72 \times 33.3$ or $\frac{0.72}{3} \times 100$ A1 for 24.72 SC B2 for 24 seen
18	(a)(i)	$x^9$	1	B1 cao
	(ii)	$p^5$	1	B1 cao
	(iii)	$12 s^6 t^5$	2	B2 cao (B1 for two of 12, $s^6$ , $t^5$ in a product)
	(iv)	$q^{12}$	1	B1 cao
	(b)	$6g - 3$	1	B1 cao
	(c)	$x^2 + 5x + 6$	2	B2 for $x^2 + 5x + 6$ (B1 for 3 out of 4 parts correct in working)
19	$4^2 + 6^2$ $16 + 36 = 52$ $\sqrt{52}$	7.21	3	M1 for $4^2 + 6^2$ or $16 + 36$ or 52 M1 for $\sqrt{16 + 36}$ or $\sqrt{52}$ A1 for 7.21 to 7.212
20	$36 \div 9$ 1 part = 4 8 : 12 : 16	A 8 B 12 C 16	3	M1 for $36 \div (2+3+4)$ M1 ( dep) for $2 \times "4"$ or $3 \times "4"$ or $4 \times "4"$ A1 cao
21	(a)	$35 \leq t < 40$	1	B1 for correct interval
	(b)	34.75	4	M1 for fx consistently within interval including ends (allow 1 error) M1 ( dep) fx using mid points M1 (dep on 1 <sup>st</sup> M) for $\sum fx \div \sum f$ A1 for 34.75 or 34.7 or 34.8

Paper 5523_04				
No	Working	Answer	Mark	Notes
22		Rotation 180° centre (0,0)	3	B1 for rotation B1 for 180° B1 for (0,0) Or B2 for enlargement , scale factor – 1 B1 for centre (0,0) SC if no marks , B1 for correct reflections
23	(a) $\tan a = \frac{5}{6}$  Angle $a = 39.8$	39.8°	3	M1 for sight of $\tan (a =) \frac{5}{6}$  M1 for $\tan^{-1}(\frac{5}{6})$ or $\tan^{-1}(0.83)$ to $\tan^{-1}(0.834)$ A1 for 39.8 to 39.81 SC 0.692 to 0.695 or 44.2 to 44.24 seen gets M1M1AO
	(b) $\sin 40^\circ = \frac{x}{10}$ $x = 10 \times \sin 40$	6.43	3	M1 for $\sin 40 = \frac{x}{10}$ M1 for $10 \times \sin 40$ A1 for 6.427 to 6.43 SC 7.45... or 5.87... seen gets M1M1AO
24		$\frac{1}{4}$  $\frac{2}{3} \quad \frac{1}{3} \quad \frac{2}{3}$	2	B1 for $\frac{1}{4}$ correct on tennis  B1 for $\frac{2}{3}, \frac{1}{3}, \frac{2}{3}$ correct on snooker
25	(a) $\frac{\sqrt{6.06}}{1.985}$	1.24015	2	B2 for 1.24015..... (B1 for sight of 2.46(...) or 1.985 or 1.24(...))
	(b)	1.24	1	B1ft for any answer to (a) correctly rounded to 2, 3 or 4 significant figures
26	$3.25 \div 25 \times 35$	4.55	2	M1 for $3.25 \div 25 \times 35$ A1 for 4.55 cao

Paper 5523_04				
No	Working	Answer	Mark	Notes
27	Adding gives $7a = 21$	$a = 3$ $b = -2$	3	M1 for a complete method which leads to a single equation in $a$ or $b$ only (allow 1 error) M1 (dep) substitute found value of $a$ or $b$ into one equation A1 cao SC :B1 for one correct answer only if Ms not awarded
28		P & C Q & D R & B S & A	2	B2 for all correct (B1 for 2 or 3 correct)

Paper 5525_05				
No	Working	Answer	Mark	Notes
1	(a) $x^2 = \frac{108}{3}$	6	2	M1 $(x^2 =) \frac{108}{3}$ (=36) or 36 seen
	(b) $2 \times 54 = 2 \times 2 \times 27$	$2 \times 2 \times 3 \times 3 \times 3$	3	A1 cao 6 or -6 or both. Also accept $\sqrt{36}$ M1 for attempt at continual prime factorisation (at least 2 correct steps); could be shown as a factor tree. A1 all 5 correct prime factors and no others A1 $2 \times 2 \times 3 \times 3 \times 3$ or $2^2 \times 3^3$ oe
2	(a)	5, -1, 1	2	B2 all three correct (B1 one or two correct)
	(b)		2	B1ft points plotted correctly $\pm 1$ full square B1 smooth curve through their plotted points provided at least B1 awarded in (a).
	(c)	3.6, -0.6	2	B2 for $x= 3.4$ to $3.8$ and $-0.8$ to $-0.4$ otherwise ft $\pm 1$ full square depends on at least B1 in (b) (B1 for one value or line $y= 3$ seen)
3	$10.5 \times 5$	52.5g	2	M1 $10.5 \times 5$ A1 cao
4		overlay	4	M1 quarter "circle" drawn centre A inside rectangle (ignore lines outside the rectangle) A1 radius 4 cm $\pm 2$ mm B1 line drawn 1 cm $\pm 2$ mm from DC. B1 ft (dep on two loci attempts drawn) region shaded
5		$\frac{26}{60}$	2	M1 $(16 + 10) \div '60'$ or 26 seen or $\frac{16}{60}$ A1 oe
6	$\frac{400 \times 6}{0.2} = \frac{2400}{0.2}$	12000-12500	3	M1 two of 400, 6, 0.2 A1 $\frac{2400}{0.2}$ or $\frac{2460}{0.2}$ or $2000 \times 6$ or $2050 \times 6$ or $400 \times 30$ or $410 \times 30$ A1 answer in range 12000 – 12500

Paper 5525_05															
No	Working	Answer	Mark	Notes											
7	(a)	126.5g	1	B1 cao											
	(b)	127.5g	1	B1 127.5 or 127.49 or 127.49.... or 127.499											
8	How many pizzas have you eaten in the last week?	Include a time period Proper response boxes	2	B1 include a time period B1 at least 3 numeric response boxes											
	<table border="1"> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>More than 3</td> </tr> </table>						0	1	2	3	More than 3				
0	1	2	3	More than 3											
9	(a)	$4.56 \times 10^5$	1	B1 cao											
	(b)	$3.4 \times 10^{-4}$	1	B1 cao											
	(c)	$1.6 \times 10^8$	1	B1 cao											
10	(a)	$(x+2)(x+4)$	2	M1 $(x \pm 2)(x \pm 4)$ A1 cao											
	(b)	-2, -4	1	B1 ft from (a) or -2, -4											
11	(a)	SF = 1.5	2	M1 SF = $\frac{12}{8}$ , $\frac{8}{12}$ , 1.5, 0.6 ... oe A1 cao											
	(b)	$45 \times \frac{8}{12}$	2	M1 $45 \times \frac{8}{12}$ , $45 \div \frac{12}{8}$ oe A1 cao											
12	(a)	$x = 3, y = 2$	1	B1 cao											
	(b)	(4,2), (5,1) (5,2), (5,3)	3	B3 all correct and none incorrect B2 at least 2 correct and not more than 4 points B1 line $x=6$ drawn or one point correct											

Paper 5525_05				
No	Working	Answer	Mark	Notes
13	(a) He has taken it from this year instead of last year (b) $\frac{240}{1.2}$	200	1 2	B1 Reason or appropriate calculation M1 $\frac{240}{1.2}$ oe A1 cao
14	(a) (b) (c)	12, 33, 69, 92, 100  62- 64 hours	1 2 2	B1 cao B1 ft for 4 or 5 points plotted correctly $\pm 1$ full 2 mm square at the end of interval dep on sensible table (condone one addition error) B1 dep for points joined by curve or line segments provided no gradient is negative . Ignore any point of graph outside range of their points. SC: B1 if 4 or 5 points plotted not at end but consistent within each interval and joined . B1 62-64 otherwise ft from cumulative freq graph B1 for hours
15	(a) 90 (b) $70 \div 2$	90°  35°	2  2	B1 90° B1 angle in semi circle (= 90°)  B1 35° or 325° B1 angle at centre = twice angle at circumference OR B1 angle on a straight line <i>with</i> isosceles triangle

No	Working	Answer	Mark	Notes
16	(a) $T = km$ $k = \frac{600}{250}$ $T = \frac{600}{250} \times 400$	960	3	M1 for $T = km$ or $\frac{600}{250} = \frac{T}{400}$ oe M1 for $(k =) \frac{600}{250}$ (=2.4) or $(T =) 400 \times \frac{600}{250}$ A1 cao
	(b) $T = \frac{K}{P}$ $T = \frac{1400 \times 360}{900}$	560	3	M1 for $T = \frac{K}{P}$ or $\frac{T}{1400} = \frac{360}{900}$ oe M1 for $(K =) 1400 \times 360$ or $360 = \frac{K}{1400}$ or $(K =) 504000$ or $(T =) \frac{360 \times 1400}{900}$ oe A1 cao
17	(a)	$\begin{pmatrix} 4 \\ 3 \end{pmatrix}$	2	M1 subtraction of coordinates or position vectors or $\begin{pmatrix} 4 \\ y \end{pmatrix}$ or $\begin{pmatrix} x \\ 3 \end{pmatrix}$ , where $x$ and $y$ are integers A1 cao SC: B1 for $\begin{pmatrix} -4 \\ -3 \end{pmatrix}$ or $\begin{pmatrix} 3 \\ 4 \end{pmatrix}$
	(b) $R = (6, 10), S = (2, 7)$ $\vec{QS} = \begin{pmatrix} 2 \\ 7 \end{pmatrix} - \begin{pmatrix} 6 \\ 6 \end{pmatrix}$	$\begin{pmatrix} -4 \\ 1 \end{pmatrix}$		B2 for $\begin{pmatrix} -4 \\ 1 \end{pmatrix}$ B1 for $\begin{pmatrix} -4 \\ y \end{pmatrix}$ or $\begin{pmatrix} x \\ 1 \end{pmatrix}$ , where $x$ and $y$ are integers

No	Working	Answer	Mark	Notes
18	(a) $\frac{3x}{x} + \frac{3x}{2x} = 2x$	$x = \frac{9}{4}$	2	M1 for $\frac{6+3}{2x}$ or $\frac{3}{x} \times x + \frac{3}{2x} \times x = 2 \times x$ or $\frac{6x+3x}{2x^2} = 2$ A1 $\frac{9}{4}$ oe
	(b) $(y-1)^2 = \frac{9}{4}$ $y-1 = \pm \frac{3}{2}$	$y = \frac{5}{2}, -\frac{1}{2}$	3	M1 $(y-1)^2 = \frac{9}{4}$ or $4y^2 - 8y - 5 = 0$ oe A1 cao $\frac{5}{2}$ oe A1 cao $-\frac{1}{2}$ oe
19	(a)	Heights 24,32	2	B1 cao for bar from 15 – 17.5, height 24 × 2mm squares B1 cao for bar from 17.5 – 20, height 32 × 2mm square
	(b)	Freqs 40, 20, 15	2	B2 cao for all 3 correct (B1 for any 1 or 2 correct)
	(c) Area up to 12.5 = 220x Area above 21 = 156x Frequency = $\frac{156x}{220x} \times 110$	78	3	M1 for attempt to find area upto 12.5 <b>and</b> area above 21 consistently M1 for $\frac{156}{220} \times 110$ or $\frac{6.24}{8.8} \times 110$ or $156 \times \frac{110}{220}$ oe A1 78 cao SC: If no marks earned B1 for $2\text{mm}^2 = 1$ person oe

No	Working	Answer	Mark	Notes
20	(a)	2	1	B1 cao
	(b)	1.5	1	B1 1.5 oe
	(c)	$16\sqrt{2}$	2	M1 ( $\sqrt{8} =$ ) $\sqrt{4 \times 2}$ or $\sqrt{2} \times \sqrt{2} \times \sqrt{2}$ or $(2^3)^{\frac{3}{2}}$ A1 for $16\sqrt{2}$ (accept $m = 16$ )
	(d)	$\frac{\sqrt{2}}{32}$	2	M1 $\frac{1}{8\sqrt{8}} \times \frac{\sqrt{8}}{\sqrt{8}}$ or $\frac{1}{8\sqrt{8}} \times \frac{8\sqrt{8}}{8\sqrt{8}}$ or $\frac{1}{"16\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}}$ oe or $\frac{1}{8\sqrt{8}} \times \frac{\sqrt{2}}{\sqrt{2}}$ A1 for $\frac{\sqrt{2}}{32}$ (accept $p = 32$ )
21	(a)		3	B1 for either $BC = CD$ or $BC = CE$ $CF = CE$ or $CF = CD$ B1 for $BCF = DCE = 150^\circ$ or correct reason
	(b)		2	B1 for proof of congruence B1 $BF = EG$ or $BF = ED$ B1 fully correct proof
22		$a = \frac{n^2 - nP}{P - 1}$	4	M1 $(n + a)P = n^2 + a$ M1 $nP + aP = n^2 + a$ M1 $a(P - 1) = n^2 - nP$ or $a(1 - P) = nP - n^2$ A1 for $a = \frac{n^2 - nP}{P - 1}$ oe

Paper 5525_05				
No	Working	Answer	Mark	Notes
23	(a)	$(2x-3)(x-2)$	2	B2 cao B1 $(2x-a)(x-b)$ , where $ab = 6$
	(b)(i)	$(n-a)(n+a-(n-a))$ or $n^2 - a^2 - (n^2 - 2an + a^2)$		M1 for $(n-a)(n+a)$ seen A1 cao or M1 for $n^2 - 2an + a^2$ seen A1 cao
	(b)(ii)	$a$ and $n-a$ are integers $2 \times n \times (n-a)$ is even	4	M1 dep for identifying $n-a$ as an integer or multiplying by 2 gives an even number or M1 dep for identifying $an$ or $a^2$ as an integer, or for the difference of two even numbers is an even number A1 correct proof
24	(a)(i)	$(0,-1)$	3	B1 cao
	(ii)	$(2,-3)$		B1 cao
	(iii)	$(1,-1)$		B1 cao
	(b)	$y = f(-x)$	1	B1 cao
	(c)	Translation by +2 parallel to the y axis	1	B1 for translation by $\begin{pmatrix} 0 \\ 2 \end{pmatrix}$

Paper 5525_06				
No	Working	Answer	Mark	Notes
1	P marked at top left and bottom		2	B2 for both correct (B1 for one correct) (-B1 for each error if more than 2Ps)
2	$36 \div 9$ 1 part = 4 8 : 12 : 16	A 8 B 12 C 16	3	M1 for $36 \div (2 + 3 + 4)$ M1 (dep) $2 \times '4'$ or $3 \times '4'$ or $4 \times '4'$ A1 cao
3	(a)	Overlay (a)	2	B2 for correct triangle with arcs (B1 for correct triangle, no arcs)
	(b)	Overlay(b)	2	M1 for 2 pairs of correct intersecting arcs A1 for correct perpendicular bisector SC If no marks B1 for line within guidelines
4	No because when $n = 6$ $6n - 1 (= 35)$ is not prime		2	B2 correctly showing when $n = 6$ , 35 is obtained and identified oe or for correctly evaluating $6n - 1$ when $n$ is 0 or negative. (B1 for correctly evaluating $6n - 1$ for at least 3 different whole number values of $n$ or 35 oe with no working)
5	$3\% = 0.72$ $1\% = 0.24$ $100\% = 24$ $103\% = 24.72$	24.72	3	M1 for $3\% = 0.72$ or $0.03x = 0.72$ M1 for $1\% = 0.24$ oe or 24 or $0.72 \times 33.3$ or $\frac{0.72}{3} \times 103$ A1 for 24.72 SC B2 for 24 seen
6	(a)(i)	$x^9$	1	B1 cao
	(ii)	$p^5$	1	B1 cao
	(iii)	$12 s^6 t^5$	2	B2 cao (B1 for two of $12, s^6, t^5$ in a product)
	(iv)	$q^{12}$	1	B1 cao
	(b)	$6g - 3$	1	B1 cao
	(c)	$2d^2 + 6d$	2	B2 cao (B1 for $2d^2$ or $6d$ )
	(d)	$x^2 + 3x + 2x + 6$	2	B2 for $x^2 + 5x + 6$ (B1 for 3 out of 4 parts correct in working)

Paper 5525_06				
No	Working	Answer	Mark	Notes
7	$4^2 + 6^2$ $16 + 36 = 52$ $\sqrt{52}$	7.21	3	M1 for $4^2 + 6^2$ or $16 + 36$ or $52$ M1 for $\sqrt{16 + 36}$ or $\sqrt{52}$ A1 for 7.21- 7.212
8	(a) (b) $8 \times 22.5$ $3 \times 27.5$ $7 \times 32.5$ $7 \times 37.5$ $15 \times 42.5$ $1390 \div 40$	$35 \leq t < 40$ 34.75	1 4	B1 for correct interval M1 for $fx$ consistently within interval including ends (allow 1 error) M1 (dep) consistently using midpoints . M1 (dep on 1 <sup>st</sup> M ) for $\sum fx \div \sum f$ A1 for 34.75 or 34.7 or 34.8
9	(a) $\frac{\sqrt{6.06}}{1.985}$ (b)	1.24015 1.24	2 1	B2 for 1.24015 ..... (B1 for sight of 2.46(....) or 1.985 or 1.24(....)) B1 ft any answer to (a) correctly rounded to 2, 3 or 4 significant figures
10		Rotation $180^\circ$ centre (0,0)	3	B1 for rotation B1 for $180^\circ$ or $\frac{1}{2}$ turn B1 for (0,0) Or B2 enlargement SF – 1 B1 centre (0,0) If no marks awarded SC B1 for correct reflections
11		$a = 3$ $b = -2$	3	M1 for a complete method which leads to a single equation in $a$ or $b$ only (allow 1 error) M1 (dep) substitute found value of $a$ or $b$ into one equation A1 cao SC B1 for one correct answer only if Ms not awarded, $a = 3$ or $b = -2$

Paper 5525_06				
No	Working	Answer	Mark	Notes
12	(a) $\tan a = \frac{5}{6}$ Angle $a = 39.8^\circ$	39.8		M1 for $\tan(a =) \frac{5}{6}$ M1 for $a = \tan^{-1}(\frac{5}{6})$ or $\tan^{-1}(0.83)$ to $\tan^{-1}(0.834)$ (Allow $\tan^{-1} 5 \div 6$ ) A1 for 39.8- 39.81 SC 0.692 – 0.695 or 44.2 – 44.24 seen gets M1M1 A0
	(b) $\sin 40^\circ = \frac{x}{10}$ $x = 10 \times \sin 40^\circ$	6.43		M1 for $\sin 40 = \frac{x}{10}$ M1 for $10 \times \sin 40$ A1 for 6.427 – 6.43 (SC 7.45... or 5.87... seen gets M1M1 A0)
13	(a)(i)	<b>p + q</b>	2	B1 cao <b>p + q</b>
	(ii)	<b>q – p</b>		B1 <b>q – p</b> oe
	(b)	$\frac{1}{2}(\mathbf{p + q})$	1	B1 $\frac{1}{2}(\mathbf{p + q})$ oe
14	$8 \times 50^2$	20 000cm <sup>2</sup>	2	M1 for $50^2$ seen A1 for 20 000cm <sup>2</sup> or 2 m <sup>2</sup>
15	(a)	-2, -1, 0, 1, 2	2	B2 for all correct (B1 for -1,0,1 if seen in list , B1 for -2 , -1, 1, 2 )
	(b) $4p + p < 8 + 7$ $p < 3$	$p < 3$	2	M1 for $4p + p < 8 + 7$ A1 cao
16		P and C Q and D R and B S and A	2	B2 for all correct (B1 for exactly 2 or exactly 3 correct)

Paper 5525_06				
No	Working	Answer	Mark	Notes
17	$m = \frac{-4}{4} = -1$ $c = 3$	$y = -x + 3$	4	M1 for clear attempt to find gradient of AB A1 for $m = -1$ B1 for $c = 3$ in $y = mx + c$ $m$ does not have to be numerical A1 for $y = -x + 3$ oe SC B2 for $y = x + 3$ seen B3 for $-x + 3$ on its own B1 for $x + 3$ on its own
18	(a)	$\frac{1}{4}$	2	B1 for $\frac{1}{4}$ correct on tennis B1 for $\frac{2}{3}, \frac{1}{3}, \frac{2}{3}$ correct on snooker
	(b)	$\frac{2}{3}$ $\frac{1}{3}$ $\frac{2}{3}$ $\frac{1}{4}$	2	M1 for $\frac{3}{4} \times \frac{1}{3}$ A1 for $\frac{1}{4}$ oe
	(c)	$\frac{7}{12}$	3	M1 for $\frac{3}{4} \times \left(\frac{2}{3}\right)$ "or" $\left(\frac{1}{4}\right) \times \left(\frac{1}{3}\right)$ M1 $\frac{3}{4} \times \left(\frac{2}{3}\right)$ + $\left(\frac{1}{4}\right) \times \left(\frac{1}{3}\right)$ A1 for $\frac{7}{12}$ oe (0.58...) Or M2 for $1 - \left(\frac{3}{4} \times \frac{1}{3} + \frac{1}{4} \times \frac{2}{3}\right)$ A1 for $\frac{7}{12}$ oe (0.58...)

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No	Working	Answer	Mark	Notes	
19	(a)(i)	6.75	1	B1 cao	
	(ii)	6.65	1	B1 cao	
	(b)(i)	$26.95 \div 6.65$	4.05263	3	M1 for “26.95” $\div$ “6.65” where $26.9 < \text{“26.95”} \leq 26.95$ and $6.65 \leq \text{“6.65”} < 6.7$ A1 for 4.05263 (...)
	(ii)	$26.85 \div 6.75$	3.97778		If M1 not earned in (i), then M1 for ‘26.85’ $\div$ ‘6.75’ where $26.85 \leq \text{‘26.85’} < 26.9$ and $6.7 < \text{‘6.75’} \leq 6.75$ A1 for 3.9777 (...)
	(c)(i)		4	2	B1 cao
	(ii)		bounds agree to 1sf		B1 for appropriate reason for 4
20	(a)	$27x^6 y^{12}$	$27x^6 y^{12}$	2	B2 for fully correct B1 for 2 of $27, x^6, y^{12}$ correct in a 3 term product
	(b)	$6x^2 + 15x - 4x - 10$	$6x^2 + 11x - 10$	2	B2 for fully correct (B1 for 3 out of 4 terms correct in working including signs or 4 terms correct, incorrect signs)
	(c)	$\frac{(x+2)(x+3)}{x(x+2)}$	$\frac{x+3}{x}$	2	B2 for $\frac{x+3}{x}$ (B1 for $x(x+2)$ or $(x+2)(x+3)$ seen)
21	$x = \frac{5 \pm \sqrt{25 - 4 \times 1 \times -8}}{2}$ $\frac{5 \pm \sqrt{57}}{2} = \frac{5 \pm 7.54983}{2}$ $x = 6.2749$ or $x = -1.2749$	6.27 or -1.27	3	M1 for correct substitution into formula up to signs on $b$ and $c$  M1 for $\frac{5 \pm \sqrt{57}}{2}$ A1 6.27 to 6.275 and -1.27 to -1.275	

Paper 5525_06				
No	Working	Answer	Mark	Notes
22	(a) $\frac{120}{360}$ or $\frac{1}{3}$ $\frac{120}{360} \times 2\pi \times 10.4$	21.7 – 21.8	3	B1 for $\frac{120}{360}$ or $\frac{1}{3}$ seen M1 for $\frac{120}{360} \times 2\pi \times 10.4$ A1 for 21.7 - 21.8
	(b) Area Sector = $\pi(10.4)^2 \div 3 = 113.26488$ Area Triangle = $\frac{1}{2}(10.4)(10.4)\sin 120^\circ$ = 46.8346 Area segment = 66.43 ....	66.4	4	M1 for $\pi(10.4)^2 \div 3$ or $\pi(10.4)^2 \times \frac{120}{360}$ oe M1 for $\frac{1}{2}(10.4)(10.4)\sin 120^\circ$ or any other valid method for area triangle <i>OAC</i> M1 (dep on at least 1 of the previous Ms) for area of sector – area of triangle <i>OAC</i> , providing the answer is positive. A1 66.35 – 66.5
23	$\frac{\sin ADB}{25} = \frac{\sin 28}{DB}$ $DB = \frac{25 \times \sin 28}{\sin 26}$ $DB = 26.77$ $DC = 26.77 \times \sin 54$	21.7	5	M1 for $\frac{\sin "26"}{25} = \frac{\sin 28}{DB}$ M1 for $DB = \frac{25 \times \sin 28}{\sin "26"}$ A1 for 26.7 – 26.8 M1 for $DC = "26.7" \times \sin 54$ A1 for 21.65 – 21.7 Or M1 for $\frac{\sin "26"}{25} = \frac{\sin "126"}{AD}$ oe M1 for $AD = \frac{25 \times \sin "126"}{\sin 26^\circ}$ A1 for 46.1 – 46.2 M1 for “46.1” $\times \sin 28^\circ$ A1 for 21.65 – 21.7

Paper 5525_06				
No	Working	Answer	Mark	Notes
24	Draw circle centre (0,0) radius 4 Draw a line through (1,2) Show two intersections	Fully correct explanation	3	M1 circle or semi-circle centre (0, 0) drawn or plotted with at least 8 points or stated A1 correct circle drawn or stated A1 straight line drawn through (1, 2) and cutting the (possibly freehand) circle at 2 distinct points or for stating that any straight line through (1,2) will cut the circle in 2 places as (1,2) is inside the circle

