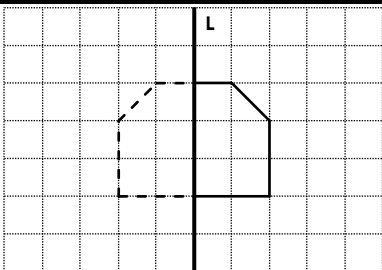
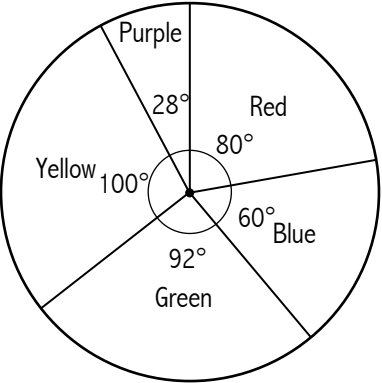
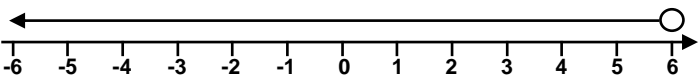


Q ^a No	Answer	Solutions	Marks	A0	Spec.
1	Paul is not correct [with reason]	Reason must be given e.g. if $n = 2$, $7n = 7 \times 2 = 14$. 14 is not an odd number \therefore Paul is wrong	A1	1	2.4a A2 N4
2			A1	1	2.3b G7
3a	1 & 3	1 occurs on the spinner 2 times 2 occurs on the spinner 3 times 3 occurs on the spinner 2 times 4 occurs on the spinner 1 time 1 & 3 have the same chance of being spun as they both occur twice	A1		2.1a P2
b	2	The spinner will most likely land on 2 as it occurs on the spinner more than any other number.	A1	2	2.1a P2 P3
4	17	Factors of 96 are numbers that divide exactly into 96. $96 \div 17 = 5.637\dots$ $5.637\dots$ is not a whole number, so 17 is not a factor of 96	B1	1	1.3a N4
5a	£230,000	The leisure centre's total income in month 1 was £500,000 The total monthly costs of the leisure centre is £270,000 The leisure centre's profit in month 1 was $500,000 - 270,000$ $= £230,000$	M1 A1		1.3a S2 N2
b	The manager is not correct [with working]	Working must be seen The total monthly costs are £270,000. The income in month 2 was £400,000 \therefore the profit in month 2 was $400,000 - 270,000 = £130,000$ The income in month 5 was £800,000 \therefore the profit in month 5 was $800,000 - 270,000 = £530,000$ Double the profit in month 2 is $2 \times 130,000 = £260,000$ $£530,000 > £260,000 \therefore$ the manager was wrong because profit in month 5 was more than double the profit in month 2	M1 M1 A1	5	2.3a 1.3a 2.4a S2 N2
6	Sarah has 30 comics Myra has 18 comics Daniel has 24 comics	Daniel, Sarah & Myra have 72 comics in total; Sarah & Myra have 48 comics between them $48 \div 2 = 24$ Sarah has 12 more comics than Myra. $12 \div 2 = 6$ Sarah has $24 + 6 = 30$ comics; Myra has $24 - 6 = 18$ comics. Daniel has $72 - 48 = 24$ comics	M1 start of process A1 A1	3	3.1c 1.3b N2
7	$5c + 11b$	Candles cost £C each; Bracelets cost £b, so 5 candles and 11 bracelets cost $(5 \times c) + (11 \times b) = 5c + 11b$	B1	1	1.3a A21
8	60 cm	Perimeter of shape is $4 \times$ length on hypotenuse of triangle where a and b are sides of the triangle and c is the hypotenuse $\therefore c = \sqrt{a^2 + b^2} = \sqrt{9^2 + 12^2} = \sqrt{81 + 144} = \sqrt{225} = 15$ Perimeter of the shape is 4×15 $= 60$ cm	M1 M1 A1	3	1.3b 3.1b G20 G17

Q ^u N ^o	Answer	Solutions	Marks	A0	Spec.
9		162 items in stock Handbag to shoe ratio is 4 : 5 Number of handbags in stock is $\frac{4}{4+5} \times 162 = \frac{4}{9} \times 162 = 72$	M1	1.3b 3.1c	R5
		Number of shoes in stock is $\frac{5}{4+5} \times 162 = \frac{5}{9} \times 162 = 90$	M1		
		Handbags cost £20 each. Shoes cost £15 each. Total amount made on sale day is $(72 \times 20) + (90 \times 15) = 1440 + 1350$	M1		
	£2790	= £2790	A1		
10a	8 cm by 12 cm	6 cm by 12 cm is $6 : 12 = (6 \div 6) : (12 \div 6) = 1 : 2$ 10 cm by 25 cm is $10 : 25 = (10 \div 5) : (25 \div 5) = 2 : 5$ 8 cm by 12 cm is $8 : 12 = (8 \div 4) : (12 \div 4) = 2 : 3$ 15 cm by 30 cm is $15 : 30 = (15 \div 15) : (30 \div 15) = 1 : 2$ The tiles with width and height in the ratio 2 : 3 are 8 cm by 12 cm	A1	1.3a	R7
b		Area where tiles will be places is 56 cm by 108 cm Each tile will be 8 cm by 12 cm The minimum number of tiles that can fit across the width of the area is $56 \div 8 = 7$ tiles	M1	1.3b 3.1d	N2 R5
		The minimum number of tiles that can fit down the height of the area is $108 \div 12 = 9$ tiles	M1		
	63	The minimum number of tiles that will fit in the area is $7 \times 9 = 63$	A1		
11		Either: £24 jeans are reduced by 18% 18% of £24 is $24 \times 0.18 = £4.32$		1.3a	R9
		Or: £24 jeans are reduced by 18% Jeans are now $100 - 18 = 82\%$ of their normal price	M1		
	£19.68	Sale price is $£24 - £4.32$ = £19.68	M1 A1		
12a	6 th term is 63 7 th term is 87	$\begin{array}{ccccccc} 3 & 7 & 15 & 27 & 43 \\ \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright & \\ +4 & +8 & +12 & +16 & \end{array}$ The rule is add 4 more than the difference between terms each time $43 - 27 = 16$; $16 + 4 = 20$; so the 6 th term is $43 + 20 = 63$ $63 - 43 = 20$; $20 + 4 = 24$; so the 7 th term is $63 + 24 = 87$	B1 B1	2.1a	A23
b	Yes [with reason]	Reason must be given The rule is add 4 more than the difference between terms each time. This will always be an even number. The beginning of the sequence is an odd number. Odd + Even = Odd, so Andrew is correct and no term in the sequence will be even.	C1	2.4a	A24
13		Angle for red is $\frac{20}{90} \times 360 = 80^\circ$ Angle for blue is $\frac{15}{90} \times 360 = 60^\circ$ Angle for green is $\frac{23}{90} \times 360 = 92^\circ$ Angle for yellow is $\frac{25}{90} \times 360 = 100^\circ$ Angle for purple is $\frac{7}{90} \times 360 = 28^\circ$	A1 at least 2 angles calculated or drawn correctly A1 all angles calculated or drawn correctly A1 fully correct pie chart with labels	2.3a 2.3b 1.3b	S2

Q ^u N ^o	Answer	Solutions	Marks	A0	Spec.
14a	£5408	£5000 in an account with 4% compound interest per year Total money in the account after 2 years in 5000×1.04^2 = £5408	M1 A1	1.3a	R9
b	£1083.26 (to the nearest penny)	£5000 in an account with 4% compound interest per year Total money in the account after 5 years in $5000 \times 1.04^5 = 6083.264\dots$; 6083.264... is £6083.26 to the nearest penny. Total interest earned over 5 years is $6083.26 - 5000$ = £1083.26 to the nearest penny	M1 M1 A1	1.3b	R9 N15
15	36 mm	A single 10p coin weighs 6.5 g; the stack of 10p coins weighs 117 g The number of 10p coins in the stack is $117 \div 6.5 = 18$ Each 10p coin is 2 mm thick The stack of 10p coins is 18×2 = 36 mm tall	M1 M1 A1	1.3b	R5
16	21 [with working]	Working must be shown 75 plum trees; 96 cherry trees; 149 apple trees; 60 extra trees; extra trees are a mixture of plum and cherry Total number of trees is $75 + 96 + 149 + 60 = 380$ 30% of the total trees are plum trees; number of plum trees is $380 \times 0.3 = 114$ Before the extra trees there were 75 plum trees $\therefore 114 - 75 = 39$ of the extra trees were plum trees The rest of the extra trees were cherry. The number of extra cherry trees planted was $60 - 39 = 21$	M1 M1 M1 A1	3.1d 1.3b	N2 R9
17	$\begin{pmatrix} 2 \\ -2 \end{pmatrix}$	$\mathbf{a + b} = \begin{pmatrix} -3 \\ 1 \end{pmatrix} + \begin{pmatrix} 5 \\ -3 \end{pmatrix}$ $= \begin{pmatrix} -3 + 5 \\ 1 + -3 \end{pmatrix} = \begin{pmatrix} 2 \\ -2 \end{pmatrix}$	C1 C1	1.2 1.3a	G25
18	50°, 80° or 20°	Angles in a triangle sum to 180° Base angles in an isosceles triangle are equal Angle A = 80° so angle B could be $\frac{180 - 80}{2} = 50^\circ$ Angle A = 80°, so angle B could also be 80° ($80 + 80 = 160^\circ$; $160^\circ < 180^\circ$) Angle A = 80, so angle C could also equal 80° \therefore angle B would be $180 - 80 - 80 = 20^\circ$	A1 A1 A1	3.1a 1.3b	G3 G6
19a	$x < 6$	Either: $5x + 4 < 40 - x$ [+x] $6x + 4 < 40$ [-4] $6x < 36$ [$\div 6$] $x < 6$ Or: $5x + 4 < 40 - x$ [-4] $5x < 36 - x$ [+x] $6x < 36$ [$\div 6$] $x < 6$	M1 _{rearrange} A1	1.3b	A22
b	 <p>Empty circle at 6 to show value is not included; arrow pointing left to show it continues to infinity</p>		C1 _{ft} ; allow dotted lines	1.2	A22

Q ^u N ^o	Answer	Solutions	Marks	A0	Spec.
20a	18.5 cm ³	<p>80.3 g of tin used; 84.75 g of lead used Density of tin is 7.3 g/cm³; Density of lead used is 11.3 g/cm³ $\text{Density} = \frac{\text{Mass}}{\text{Volume}} \therefore \text{Volume} = \frac{\text{Mass}}{\text{Density}}$ Volume of tin used is $\frac{80.3}{7.3} = 11 \text{ cm}^3$ Volume of lead used is $\frac{84.75}{11.3} = 7.5 \text{ cm}^3$ Volume of alloy cylinder is $11 + 7.5 = 18.5 \text{ cm}^3$</p>	A1 volume of cylinder	1.3b 3.1c	R11 G15
b	4.1 cm	<p>Volume of cylinder is $\pi r^2 l$; $r = 1.2 \text{ cm}$ $\pi r^2 l = 18.5 \text{ cm}^3$ [substitute $r = 1.2$] <hr/> $\pi(1.2)^2 l = 18.5$ [simplify] $\pi(1.44)l = 18.5$ [$\div (\pi \times 1.44)$] $l = \frac{18.5}{\pi \times 1.44}$ <hr/> $= 4.089 \dots \text{ cm} = 4.1 \text{ cm}$ correct to 1 decimal place</p>	<p>M1 correct equation equals 18.5 <hr/> M1 dividing by $\pi \times 1.44$ <hr/> A1 answer to 1 decimal place</p>	4	1.3b 3.1c R11 G15
21	52.5%	<p>Area of a circle = πr^2 where r is the radius Total area of the picture that is in focus is $\pi \times 3.5^2 = 12.25\pi$ <hr/> Total area of the picture that is blurred is $81 - 12.25\pi = 42.515 \dots$ <hr/> Percentage of the picture that is blurred = $\frac{\text{Total area blurred}}{\text{Total picture area}} \times 100$ Area of a square = (side length)² Total area of the picture is $9^2 = 81 \text{ cm}^2$ Percentage of picture that is blurred is $\frac{42.515 \dots}{81} \times 100$ <hr/> $= 52.488 \dots = 52.5\%$ correct to 1 decimal place</p>	<p>M1 <hr/> M1 <hr/> M1 <hr/> A1</p>	4	1.3b 3.1d G17 R9
22	Donna's assumption is wrong [with working]	<p>Working must be shown The total area to be painted is 72 m² 1 tin covers 3 m² To cover the exact area, Donna would need $72 \div 2.7 = 26.66 \dots$ tins. 26.66... rounds up to 27 (tins can only be bought as wholes & 2 is not enough) <hr/> To buy enough paint to cover an extra 15% of the area of the wall Donna will need to buy enough to cover an extra $72 \times 0.15 = 10.8 \text{ m}^3$ Donna will need to buy an extra $10.8 \div 2.7 = 4$ tins. <hr/> If Donna bought 15% more tins, she would buy an extra $27 \times 0.15 = 4.05$ tins 4.05 rounds up to 5 (tins can only be bought as wholes & 4 is not enough) <hr/> $5 > 4 \therefore$ Donna's assumption is wrong, she will not need to buy 15% more tins</p>	<p>M1 <hr/> M1 <hr/> M1 <hr/> A1</p>	4	3.1d 1.3b 2.4a N2 N15 R9

Q ^u N ^o	Answer	Solutions	Marks	A0	Spec.
23		<p>Straight line equations can be written in the form $y = mx + c$ where m is the gradient & c is the y-intercept</p> <p>Two straight lines are parallel if their equations have the same gradient.</p> <p>Rewrite equations for lines B & C in the form $y = mx + c$</p> <p>Line B: $2x + 4y = 7$ [$-2x$]</p> <p style="padding-left: 40px;">$\rightarrow 4y = 7 - 2x$ [$\div 4$]</p> <p style="padding-left: 40px;">$\rightarrow y = \frac{7}{4} - \frac{2}{4}x$</p> <p style="padding-left: 40px;">$\rightarrow y = \frac{7}{4} - \frac{1}{2}x$</p> <p>Line C: $6x - 3y = 9$ [$+3y$]</p> <p style="padding-left: 40px;">$\rightarrow 6x = 9 + 3y$ [-9]</p> <p style="padding-left: 40px;">$\rightarrow 6x - 9 = 3y$ [$\div 3$]</p> <p style="padding-left: 40px;">$\rightarrow 2x - 3 = y$</p> <p style="padding-left: 40px;">$\rightarrow y = 2x - 3$</p> <p>Line A: $y = 3x - 2$</p> <p>Line B: $y = \frac{7}{4} - \frac{1}{2}x$</p> <p>Line C: $y = 2x - 3$</p> <p>Line D: $y = 5x + 3$</p> <p>Line E: $y = 2x + 3$</p> <p>Lines C & E</p> <p>Lines C & E are parallel because they have the same gradient ($m = 2$)</p>	<p>M1 rewriting equations in the form $y = mx + c$</p> <p>A1 correct pair of lines</p>	1.3a 2.1a	A4 A9
24a	$x = \pm 5$	<p>Either:</p> <p>$4x^2 = 100$ [$\div 4$]</p> <hr/> <p>$x^2 = 25$ [$\sqrt{\quad}$]</p> <p>$x = \pm 5$</p> <p>Or:</p> <p>$4x^2 = 100$ [$\sqrt{\quad}$]</p> <hr/> <p>$2x = \pm 10$ [$\div 2$]</p> <p>$x = \pm 5$</p>	<p>M1 [$\div 4$] or square rooting both sides</p> <p>A1+5 A1-5</p>	1.3b	A18
b	$x = 2$ or $x = 4$	<p>Factorise $x^2 - 6x + 8$ by finding 2 numbers which add to make -6 and multiply to make 8. ($-4 + -2 = -6$); ($-4 \times -2 = 8$)</p> <p>$x^2 - 6x + 8 = (x - 2)(x - 4) = 0$</p> <hr/> <p>$(x - 2) = 0$ or $(x - 4) = 0$</p> <p>$x = 0 + 2 = 2$ or $x = 0 + 4 = 4$</p>	<p>M1 $(x \pm 2)(x \pm 4)$</p> <p>M1 $(x - 2)(x - 4)$</p> <p>A1</p>	1.3b	A18

Q ^u N ^o	Answer	Solutions	Marks	A0	Spec.
25a	$12y - 8x$	Internal perimeter is $(3y - 2x) + (3y - 2x) + (3y - 2x) + (3y - 2x)$ = $12y - 8x$	M1 A1	2.3b	G17 A4
b	$x = 3$	External perimeter is $(2x + 3y) + (2x + 3y) + (2x + 3y) + (2x + 3y) = 8x + 12y$ (1) External perimeter is $3 \times \text{internal perimeter} = 3(12y - 8x) = 36y - 24x$ (2) $\therefore 8x + 12y = 36y - 24x$ [simplify] You are given that $y = 4$ Substitute $y = 4$ into (3) $8x + 12y = 36y - 24x \rightarrow 8x + (12 \times 4) = (36 \times 4) - 24x$ $\rightarrow 8x + 48 = 144 - 24x$ [+24x] $32x + 12 = 144$ [-48] $32x = 96$ [$\div 32$] $x = 3$	M1 M1 M1 A1	2.3b 3.1b 1.3b 6	G17 A4 A17
Total Marks: 80					