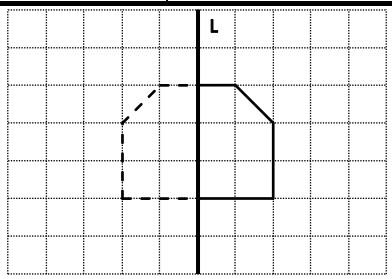
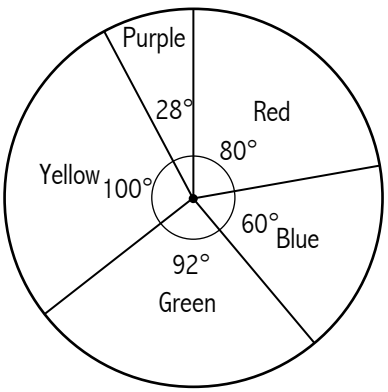
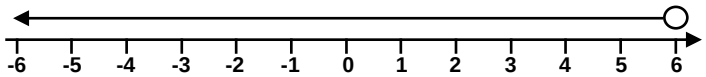
AQA Practice GCSE Examination Paper Foundation Set 8 Paper 3 Calculator	Solutions

Qu №	Answer	Solutions	Marks		AO	Spec.
1a	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
2	17	Factors of 96 are numbers that divide exactly into 96. $96 \div 17 = 5.637\ldots$ $5.637\ldots$ is not a whole number, so 17 is not a factor of 96	B1	**1**	1.3a	N4
3	$\frac{2a}{b}$	$6a \div 3b = \frac{6a}{3b} = \frac{3(2a)}{3(b)} = \frac{2a}{b}$	A1	**1**	1.3a	A4 N3
4	No (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 ∴ Paul is wrong	A1	**1**	2.4a	A2 N4
5			A1	**1**	2.3b	G7
6a	£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	No (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 ∴ the profit in month 2 was 400,000 – 270,000 = £130,000 The income in month 5 was £800,000 ∴ the profit in month 5 was 800,000 – 270,000 = £530,000 Double the profit in month 2 is 2 × 130,000 = £260,000 £530,000 > £260,000 ∴ 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
7	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
8	$5c + 11b$	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
9	60 cm	Perimeter of shape is 4 × 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

Qu №	Answer	Solutions	Marks		AO	Spec.
10	£2790	162 items in stock Handbag to shoe ratio is 4 : 5 Number of handbags in stock is $\frac{4}{4+5}\times 162=\frac{4}{9}\times 162=72$ Number of shoes in stock is $\frac{5}{4+5}\times 162=\frac{5}{9}\times 162=90$ Handbags cost £20 each. Shoes cost £15 each. Total amount made on sale day is (72 × 20) + (90 × 15) = 1440 + 1350 = £2790 ***Alternative ratio method:*** Handbags : Shoes : Total 4 : 5 : 9 [× 18] 72 : 90 : 162 So total sales = (72 × £20) + (90 × £15) = £2790	M1 M1 M1 A1	**4**	1.3b 3.1c	R5
11a	8 cm by 12 cm	6 cm by 12 cm is 6 : 12 = (1 × 6) : (2 × 6) = 1 : 2 10 cm by 25 cm is 10 : 25 = (2 × 5) : (5 × 5) = 2 : 5 8 cm by 12 cm is 8 : 12 = (2 × 4) : (3 × 4) = 2 : 3 15 cm by 30 cm is 15 : 30 = (1 × 15) : (2 × 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	63	Area where tiles will be placed 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 ÷ 8 = 7 tiles The minimum number of tiles that can fit down the height of the area is 108 ÷ 12 = 9 tiles The minimum number of tiles that will fit in the area is 7 × 9 = 63	M1 M1 A1	**4**	1.3b 3.1d	N2 R5
12	£19.68	**Either:** £24 jeans are reduced by 18% 18% of £24 is 24 × 0.18 = £4.32 Sale price is £24 − £4.32 = £19.68 **Or:** £24 jeans are reduced by 18% Jeans are now 100 − 18 = 82% of their normal price Sale price is £24 × 0.82 = £19.68	M1 M1 A1	**3**	1.3a	R9
13a	63, 87	3 (+4) 7 (+8) 15 (+12) 27 (+16) 43 The rule is add 4 more than the difference between terms each time 43 − 27 = 16; 16 + 4 = 20; so the 6th term is 43 + 20 = 63 63 − 43 = 20; 20 + 4 = 24; so the 7th term is 63 + 24 = 87	B1		2.1a	A23
b	Yes (Andrew is correct) [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.	A1	**2**	2.4a	A24
14		Angle for red is $\frac{20}{90}\times 360=80°$ Angle for blue is $\frac{15}{90}\times 360=60°$ Angle for green is $\frac{23}{90}\times 360=92°$ Angle for yellow is $\frac{25}{90}\times 360=100°$ Angle for purple is $\frac{7}{90}\times 360=28°$	A1 at least 2 angles calculated or drawn correctly A1 all angles calculated or drawn correctly A1 fully correct pie chart with labels	**3**	2.3a 2.3b 1.3b	S2

Qu №	Answer	Solutions	Marks		AO	Spec.
15a		£5000 in an account with 4% compound interest per year Total money in the account after 2 years in 5000×1.04^2	M1		1.3a	R9
	£5408	= £5408	A1			
b		£5000 in an account with 4% compound interest per year Total money in the account after 5 years in 5000×1.04^5 = 6083.264…; 6083.264… is £6083.26 to the nearest penny.	M1		1.3b	R9 N15
	£1083.26 (to the nearest penny)	Total interest earned over 5 years is 6083.26 – 5000	M1			
		= £1083.26 to the nearest penny	A1	**5**		
16		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 ÷ 6.5 = 18	M1		1.3b	R5
		Each 10p coin is 2 mm thick The stack of 10p coins is 18 × 2	M1			
	36 mm	= 36 mm tall	A1	**3**		
17		***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	M1		3.1d 1.3b	N2 R9
		30% of the total trees are plum trees; number of plum trees is 380 × 0.3 = 114	M1			
		Before the extra trees there were 75 plum trees ∴ 114 – 75 = 39 of the extra trees were plum trees	M1			
	21 [with working]	The rest of the extra trees were cherry. The number of extra cherry trees planted was 60 – 39 = 21	A1	**4**		
18		$\mathbf{a}+\mathbf{b}=\begin{pmatrix}-3\\1\end{pmatrix}+\begin{pmatrix}5\\-3\end{pmatrix}$	M1		1.2 1.3a	G25
	$\begin{pmatrix}2\\-2\end{pmatrix}$	$=\begin{pmatrix}-3+5\\1+-3\end{pmatrix}=\begin{pmatrix}2\\-2\end{pmatrix}$	A1	**2**		
19		Angles in a triangle sum to 180° Base angles in an isosceles triangle are equal Angle A = 80° so angle B could be $\frac{180-80}{2}=50°$	A1		3.1a 1.3b	G3 G6
		Angle A = 80°, so angle B could also be 80° (80 + 80 = 160°; 160° < 180°)	A1			
	50°, 80° or 20°	Angle A = 80, so angle C could also equal 80° ∴ angle B would be 180 – 80 – 80 = 20°	A1	**3**		
20a		**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
	$x<6$						
b	 **Empty** circle at 6 to show value is not included; **arrow** pointing left to show it continues to infinity		A1 ft; allow dotted lines	**3**	1.2	A22

Qu №	Answer	Solutions	Marks		AO	Spec.
21a		80.3 g of tin used; 84.75 g of lead used Density of tin is 7.3 g/cm^3; Density of lead used is 11.3 g/cm^3 $\text{Density} = \frac{\text{Mass}}{\text{Volume}}$ $\therefore$ $\text{Volume} = \frac{\text{Mass}}{\text{Density}}$ Volume of tin used is $\frac{80.3}{7.3} = 11\text{ cm}^3$ Volume of lead used is $\frac{84.75}{11.3} = 7.5\text{ cm}^3$			1.3b 3.1c	R11 G15
	18.5 cm^3	Volume of alloy cylinder is 11 + 7.5 = 18.5 cm^3	A1 volume of cylinder			
b		Volume of cylinder is $\pi r^2 l$; $r = 1.2$ cm $\pi r^2 l = 18.5\text{ cm}^3$ [substitute $r = 1.2$]	M1 correct equation equals 18.5		1.3b 3.1c	R11 G15
		$\pi(1.2)^2 l = 18.5$ [simplify] $\pi(1.44)l = 18.5$ [$\div(\pi \times 1.44)$] $l = \frac{18.5}{\pi \times 1.44}$	M1 dividing by $\pi \times$ 1.44			
	4.1 cm	= 4.089… cm = 4.1 cm correct to 1 decimal place	A1 answer to 1 decimal place	**4**		
22		Area of a circle = πr^2 where r is the radius Total area of the picture that is in focus is $\pi \times 3.5^2 = 12.25\pi$	M1		1.3b 3.1d	G17 R9
		Area of a square = (side length)^2 Total area of the picture is 9^2 = 81 cm^2 Total area of the picture that is blurred is 81 − 12.25π = 42.515…	M1			
		Percentage of the picture that is blurred = $\frac{\text{Total area blurred}}{\text{Total picture area}} \times 100$ Percentage of picture that is blurred is $\frac{42.515...}{81} \times 100$	M1			
	52.5%	= 52.488… = 52.5% correct to 1 decimal place	A1	**4**		
23		***Working must be shown*** The total area to be painted is 72 m^2 1 tin covers 2.7 m^2 To cover the exact area, Donna would need 72 ÷ 2.7 = 26.66… tins. 26.66… rounds up to 27 (tins can only be bought as wholes & 26 is not enough)	M1		3.1d 1.3b 2.4a	N2 N15 R9
		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 × 0.15 = 10.8 m^3 Donna will need to buy an extra 10.8 ÷ 2.7 = 4 tins.	M1			
	No (Donna's assumption is wrong) [with working]	If Donna bought 15% more tins, she would buy an extra 27 × 0.15 = 4.05 tins 4.05 rounds up to 5 (tins can only be bought as wholes & 4 is not enough)	M1			
		5 > 4 ∴ Donna's assumption is wrong, she will not need to buy 15% more tins	A1	**4**		

Qu №	Answer	Solutions	Marks		AO	Spec.
24		Straight line equations can be written in the form $y = mx + c$ where m is the gradient & c is the y-intercept Two straight lines are parallel if their equations have the same gradient. Rewrite equations for lines B & C in the form $y = mx + c$ Line B: $2x + 4y = 7$ $[-2x]$ $\rightarrow 4y = 7 - 2x$ $[\div 4]$ $\rightarrow y = \frac{7}{4} - \frac{2}{4}x$ $\rightarrow y = \frac{7}{4} - \frac{1}{2}x$ Line C: $6x - 3y = 9$ $[+3y]$ $\rightarrow 6x = 9 + 3y$ $[-9]$ $\rightarrow 6x - 9 = 3y$ $[\div 3]$ $\rightarrow 2x - 3 = y$ $\rightarrow y = 2x - 3$	M1 rewriting equations in the form $y = mx + c$		1.3a 2.1a	A4 A9
	Lines C & E	Line A: $y = 3x - 2$ Line B: $y = \frac{7}{4} - \frac{1}{2}x$ Line C: $y = 2x - 3$ Line D: $y = 5x + 3$ Line E: $y = 2x + 3$ Lines C & E are parallel because they have the same gradient ($m = 2$)	A1 correct pair of lines	**2**		
25a	$x = \pm 5$	**Either:** $4x^2 = 100$ $[\div 4]$ $x^2 = 25$ $[\sqrt{\ }]$ $x = \pm 5$ **Or:** $4x^2 = 100$ $[\sqrt{\ }]$ $2x = \pm 10$ $[\div 2]$ $x = \pm 5$	M1 [÷ 4] or square rooting both sides A1 +5 A1 –5		1.3b	A18
b	$x = 2$ or $x = 4$	Factorise $x^2 - 6x + 8$ by finding 2 numbers which add to make –6 and multiply to make 8. $(-4 + -2 = -6)$; $(-4 \times -2 = 8)$ $x^2 - 6x + 8 = (x - 2)(x - 4) = 0$ $(x - 2) = 0$ or $(x - 4) = 0$ $x = 0 + 2 = 2$ or $x = 0 + 4 = 4$	M1 $(x \pm 2)(x \pm 4)$ M1 $(x - 2)(x - 4)$ A1	**6**	1.3b	A18
26a	$12y - 8x$ or $4(3y - 2x)$	Internal perimeter is $(3y - 2x) + (3y - 2x) + (3y - 2x) + (3y - 2x)$ $= 12y - 8x$	M1 A1		2.3b	G17 A4
b		External perimeter is $(2x + 3y) + (2x + 3y) + (2x + 3y) + (2x + 3y) = 8x + 12y$ (1) External perimeter is 3 × 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) $8x + 12y = 36y - 24x \rightarrow 8x + (12 \times 4) = (36 \times 4) - 24x$ $\rightarrow 8x + 48 = 144 - 24x$ $[+24x]$ $32x + 48 = 144$ $[-48]$ $32x = 96$ $[\div 32]$	M1 M1 M1		2.3b 3.1b 1.3b	G17 A4 A17
	$x = 3$	$x = 3$	A1	**6**		
			Total Marks: 80			