

OCR Practice GCSE Examination Paper Foundation Set 2 Paper 1 Calculator				Solutions																									
Q ^u N ^o	Answer	Solutions		Marks		Spec.																							
1a	$\frac{3}{5}$	25 counters in total; 15 of the counters are red Fraction of counters which are red is $\frac{15}{25} = \frac{3 \times 5}{5 \times 5}$		M1		R3																							
		$= \frac{3}{5}$		A1																									
bi	5 : 6	$120 : 144 = (60 \times 2) : (72 \times 2) = 60 : 72$ $= (5 \times 12) : (6 \times 12) = 5 : 6$		A1		R4																							
ii	48 & 64	Ratio is 3 : 4 Total is 3 + 4 = 7 $112 \div 7 = 16$		M1		R4 R5																							
		112 in ratio 3 : 4 is $3 \times 16 = 48$ & $4 \times 16 = 64$		M1																									
		48 & 64		A1																									
c	£265.20	Either: Sale price is 22% off the normal price $100 - 22 = 78\%$	Or: Sale price is 22% off the normal price $0.22 \times 340 = 74.8$	M1		R9																							
		Sale price of the exercise bike is $0.78 \times 340 = 265.2$	Sale price of the exercise bike is $340 - 74.8 = 265.2$	M1																									
		$= £265.20$ (in pounds)		A1																									
2	16	$x = 48$ & $y = 3$, $\frac{x}{y} = \frac{48}{3} = 16$		B1	9	A2																							
3a	£1.20	Price of 1 pen: $3.60 \div 6 = £0.60$		M1		N2 N3																							
		Price of 2 pens: $0.60 \times 2 = £1.20$		A1																									
b	£2.95	Total cost of snacks: $3.50 + (2 \times 1.25) + (3 \times 0.95) = £8.85$		M1	4	N2																							
		Cost per person: $8.85 \div 3 = £2.95$		A1																									
4	Yes (Olivia is correct) [with working]	Working must be shown $25\% \text{ of } 100 = 100 \times 0.25 = 25$ $20\% \text{ of } 125 = 125 \times 0.2 = 25$		M1		R9																							
		$\therefore 25\% \text{ of } 100 = 20\% \text{ of } 125$. Olivia is correct.		A1																									
5a		<table><tr><th>Coin</th><th>Spinner</th></tr><tr><td>Heads</td><td>1</td></tr><tr><td>Heads</td><td>2</td></tr><tr><td>Heads</td><td>3</td></tr><tr><td>Heads</td><td>4</td></tr><tr><td>Heads</td><td>5</td></tr><tr><td>Tails</td><td>1</td></tr><tr><td>Tails</td><td>2</td></tr><tr><td>Tails</td><td>3</td></tr><tr><td>Tails</td><td>4</td></tr><tr><td>Tails</td><td>5</td></tr></table>		Coin	Spinner	Heads	1	Heads	2	Heads	3	Heads	4	Heads	5	Tails	1	Tails	2	Tails	3	Tails	4	Tails	5	M1 at least 5 correct combinations A1 all correct			P6 P7
Coin	Spinner																												
Heads	1																												
Heads	2																												
Heads	3																												
Heads	4																												
Heads	5																												
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Tails	2																												
Tails	3																												
Tails	4																												
Tails	5																												

Qu No	Answer	Solutions	Marks	Spec.																
b	No (Ben is incorrect) [with working]	Answer must be justified with working Total number of possible outcomes is 10 Number of possible outcomes of tails & an even number is 2 $P(\text{tails \& even number}) = \frac{\text{Number of tails \& even number}}{\text{Total number of possible outcomes}} = \frac{2}{10}$ <hr/> Number of possible outcomes of heads & an odd number is 3 $P(\text{heads \& odd number}) = \frac{\text{Number of heads \& odd number}}{\text{Total number of possible outcomes}} = \frac{3}{10}$ <hr/> $\frac{3}{10} > \frac{2}{10}$, so Ben is wrong. The probability of getting heads & an odd number is greater than the probability of getting tails & an even number.	M1 M1 B1	P7 N5 5																
6a	130°	$a = 180 - 50 = 130^\circ$ [straight line angles sum to 180°]	A1	G3																
b	70°	$b = 180 - 50 - 60 = 70^\circ$ [angles in triangle sum to 180°]	A1	G3																
c	6 cm ²	Area of a triangle = $\frac{1}{2} \times \text{base} \times \text{height}$ Base of triangle is 4 cm long; height of triangle is 3 cm Area of triangle is $\frac{1}{2} \times 3 \times 4$ <hr/> = 6 cm ²	M1 A1	G16 4																
7	Yes [with calculation]	Supporting calculation must be seen $1^3 = 1$; $2^3 = 8$; $3^3 = 27$; $4^3 = 64$; $5^3 = 125$ <hr/> $1 + 8 + 27 + 64 = 100$ <hr/> \therefore Erin is correct	M1 listing square numbers M1 A1	N2 N6 3																
8	Calculate at least 2 points on the line e.g. <table><tr><td>x</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr><tr><td>$y = 9 - x$</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td></tr></table>		x	0	1	2	3	4	5	6	$y = 9 - x$	9	8	7	6	5	4	3	M1 2 correct points	A9 <
x	0	1	2	3	4	5	6													
$y = 9 - x$	9	8	7	6	5	4	3													

Q ^u N ^o	Answer	Solutions	Marks	Spec.
9		<p>Either:</p> $\frac{1}{5} = 1 \div 5 = 0.2;$ $\frac{1}{3} = 1 \div 3 = 0.333...;$ $\frac{1}{4} = 1 \div 4 = 0.25$ <p>Or:</p> $\frac{1}{5} = \frac{1 \times 3 \times 4}{5 \times 3 \times 4} = \frac{12}{60};$ $\frac{1}{3} = \frac{1 \times 5 \times 4}{3 \times 5 \times 4} = \frac{20}{60};$ $\frac{1}{4} = \frac{1 \times 5 \times 3}{4 \times 5 \times 3} = \frac{15}{60}$	M1 method of comparison	N10
	$\frac{1}{5}$	$0.25 - 0.2 = 0.05$ $0.333... - 0.25 = 0.08333...$ <p>0.2 is closer to 0.25, so $\frac{1}{5}$ is closer</p> <p>to $\frac{1}{4}$ than $\frac{1}{3}$</p>	A1	2
10a		<p>Working must be shown</p> <p>Shop A sells material for £1.20 per yard</p> $1 \text{ yard} = 3 \text{ feet} \therefore 15 \text{ feet} = \frac{15}{3} = 5 \text{ yards}$ <p>15 feet of material from shop A is $5 \times £1.20 = £6$</p> <p>Shop B sells material for £1.50 per metre</p> $1 \text{ foot} = 30.48 \text{ cm} \therefore 15 \text{ feet} = 15 \times 30.48 = 457.2 \text{ cm}$ $1 \text{ cm} = 0.01\text{m} \therefore 457.2 \text{ cm} = 457.2 \times 0.01 = 4.572 \text{ m}$ <p>15 feet of material from shop B is $4.572 \times 1.5 = 6.858$; 6.858 is £6.86 to the nearest penny</p> <p>$£6 < £6.86 \therefore$ it is cheaper to buy the material from shop A</p>	M1 M1 M1 M1 A1	R1 N2
b		<p>Bouquets cost £7.50 each</p> <p>4 for the price of 3 offer means 4 bouquets cost $7.50 \times 3 = £22.50$</p> <p>Eloise has a budget of £150</p> <p>Eloise can buy $150 \div 22.50 = 6.666...$ sets of 4 bouquets</p> <p>6.666... rounds down to 6 (not enough money for 7 sets of 4)</p> <p>6 sets of 4 bouquets costs $6 \times 22.50 = £135$</p> <p>Eloise has $150 - 135 = £15$ left in the budget</p> <p>This is enough to buy $15 \div 7.50 = 2$ more bouquets of flowers</p> <p>The total number of bouquets Eloise can buy is $(6 \times 4) + 2 = 24 + 2 = 26$</p>	M1 M1 M1 M1 M1 A1	N2 N15
	26			11

Q ^u N ^o	Answer	Solutions	Marks	Spec.
11ai	$C = \frac{V + 75}{12}$	$C = (V + 75) \div 12 = \frac{V + 75}{12}$	B1	A21
ii		Rearrange to make V the subject: $C = \frac{V + 75}{12} \quad [\times 12]$ $12C = V + 75 \quad [-75]$ $12C - 75 = V \rightarrow V = 12C - 75$	M1 rearranging to make V the subject	A2 A5
	£168	Substitute in the cost per month, $C = 20.25$, to find V : $V = 12C - 75 = (12 \times 20.25) - 75$ $V = 243 - 75 = £168$	M1 substituting A1	
b	32%	Television is on sale for 20% off the normal price Sale price is $100 - 20 = 80\%$ of normal price Extra 15% is taken off the sale price Price sold for is $100 - 15 = 85\%$ of sale price Price sold for is $(0.8 \times 0.85) \times 100 = 0.68 \times 100 = 68\%$ of the normal price Overall reduction from the normal price is $100 - 68 = 32\%$	M1 M1 M1 M1 A1	R9 9
12	42	mean = $\frac{\text{sum of all numbers}}{\text{number of numbers}}$ The sum of all five numbers is $3 + 16 + 9 + 38 + 24 = 90$ The mean of the set of five numbers is $90 \div 5 = 18$ The mean of the set of six numbers is $18 + 4 = 22$ The sum of the six number is $22 \times 6 = 132$ The sixth number = (the sum of the set of six numbers) – (the sum of the set of five numbers) The sixth number is $132 - 90 = 42$	M1 M1 M1 A1	S4 4
13a	2^4 or 16	HCF is found by multiplying the common prime factors of the 2 numbers $96 = 2^5 \times 3 = \underline{2} \times \underline{2} \times \underline{2} \times \underline{2} \times 2 \times 3$ $112 = 2^4 \times 7 = \underline{2} \times \underline{2} \times \underline{2} \times \underline{2} \times 7$ Common prime factors: $2 \times 2 \times 2 \times 2$ HCF of 96 & 112 = $2^4 = 16$	M1 finding common prime factors A1	N4
b	672	LCM is found by multiplying the HCF by any uncommon prime factors of 96 & 112 $96 = 2^5 \times 3 = \cancel{2} \times \cancel{2} \times \cancel{2} \times \cancel{2} \times 2 \times 3$ $112 = 2^4 \times 7 = \cancel{2} \times \cancel{2} \times \cancel{2} \times \cancel{2} \times 7$ of 96 & 112 = HCF $\times 2 \times 3 \times 7 = 16 \times 2 \times 3 \times 7$ = 672	Multiples of 96: 96, 192, 288, 384, 480, 576, 672 Multiples of 112: 112, 224, 336, 448, 560, 672 M1 HCF \times remaining prime factors, or listing multiples of 96 & 112 LCM of 96 & 112 is 672 A1	N4 4
14	4.05 cm^3	Volume increases by 35% with each breath Volume after 1 st breath is 3 cm^3 Volume after 2 nd breath is $3 \times 1.35 = 4.05 \text{ cm}^3$	M1 A1	R9 2

Q ^u N ^o	Answer	Solutions	Marks	Spec.
15a	$\frac{5}{9}$	$\sin \theta = \frac{\text{opposite}}{\text{hypotenuse}}$ Opposite = 9 cm; Hypotenuse = 5 cm $\sin \theta = \frac{5}{9}$	A1	G20
b	3.6 cm	Triangles are similar \therefore their angles are the same Opposite = 2 cm; Hypotenuse = y cm $\sin \theta = \frac{\text{opposite}}{\text{hypotenuse}}$ $\rightarrow \text{hypotenuse} = \frac{\text{opposite}}{\sin \theta}$ <hr/> $y = \frac{2}{\sin x} = \frac{2}{\frac{5}{9}}$ <hr/> = 3.6 cm	M1 <hr/> M1 <hr/> A1	G20 <hr/> <hr/> 4
16a	$\frac{5}{20}$ or $\frac{1}{4}$	The median is the middle number of the ordered list. There is information about 20 students. $(20 + 1) \div 2 = 10.5$, so the median is the mean of the 10 th and 11 th shoe size. <hr/> The 10 th shoe size is 6 & the 11 th shoe size is 6 \therefore the median shoe size is 6. <hr/> 5 students in the class of 20 wore size 6 shoes. <hr/> The probability of picking a student with size 6 shoes is $\frac{5}{20} = \frac{1}{4}$	M1 <hr/> M1 <hr/> M1 <hr/> A1	S2 S4 P3 <hr/> <hr/> <hr/> <hr/>
b	5.95	mean = $\frac{\text{sum of all shoe sizes}}{\text{number of students}}$ The sum of all the shoe sizes is $(1 \times 3) + (2 \times 4) + (5 \times 5) + (5 \times 6) + (3 \times 7) + (4 \times 8) = 119$ <hr/> There were 20 students in the class The mean shoe size of the class was $119 \div 20$ <hr/> = 5.95	M1 <hr/> M1 <hr/> A1	S4 <hr/> 7
17	360	Male to female ratio is 11: 7 Fraction of male gym members is $\frac{11}{11+7} = \frac{11}{18}$ Fraction of female gym members is $\frac{7}{11+7} = \frac{7}{18}$ <hr/> There are 80 more male gym member than females; this makes up $\frac{11}{18} - \frac{7}{18} = \frac{11-7}{18} = \frac{4}{18} = \frac{2}{9}$ of the total gym members <hr/> The total number of gym members is $(80 \div 2) \times 9$ <hr/> = 360	M1 <hr/> M1 <hr/> M1 <hr/> A1	R4 R5 <hr/> 4

Q ^u N ^o	Answer	Solutions	Marks	Spec.
18a	$p \leq 5$	$3p + 8 \leq 23$ $[-8]$	M1 rearranging	A22
		$3p \leq 15$ $[\div 3]$ $p \leq 5$	A1	
b	25	$\frac{q-6}{2} > 9$ $[\times 2]$	M1 rearranging	A22
		$q - 6 > 18$ $[+6]$ $q > 24$	M1	
		Smallest integer to satisfy this inequality is 25	A1	
c	$x = \frac{y}{(2+t^2)}$	$y = 2x + xt^2$ [factorise] $y = x(2+t^2)$ [divide by $(2+t^2)$] $\frac{y}{(2+t^2)} = x$	M1	A5
		$\therefore x = \frac{y}{(2+t^2)}$	A1	
19a	By assuming there are 15 biscuits in each bag [with working]	Working must be shown 7 bags of chocolate biscuits cost £25.20 1 bag of chocolate biscuits costs $25.20 \div 7 = \text{£}3.60$	M1	N2
		There are 15 – 20 biscuits in each bag. Simone says each biscuit cost 24 p, 24p = £0.24. Number of biscuits in each bag is $3.60 \div 24 = 15$	M1	
		Simone concluded that the biscuits cost 24p by assuming there were 15 biscuits in each bag.	A1	
b	Any suitable explanation	e.g. The label says there are between 15 and 20 biscuits in each bag. Simone assumed that there were only 15 in each bag. If there are more than 15 in each bag, the cost of each biscuit will decrease and Simone will be wrong.	A1	N2
20	263 [with working]	Working must be shown 550 counters in total; 65 yellow counters; 453 blue counters Number of green counters is $550 - 65 - 453 = 32$	M1	N2
		All winning counters were picked. Yellow counters win £3; green counters win £5. Total amount given away as prizes is $(65 \times 3) + (32 \times 5) = 195 + 160 = \text{£}355$	M1	
		£185 profit was made Total amount earned from the game was $185 + 355 = \text{£}540$	M1	
		The game costs £1.50 to play The total number of people that played the game was $540 \div 1.50 = 360$	M1	
		All the yellow and green counters were picked. The total number of blue counters that were picked was $360 - 65 - 32 = 263$	A1	
21	285 cm	The perimeter of the quadrilateral is $(5x + 4) + (5x + 2) + (2x + 7) + 4x = 16x + 13$	M1	A4 G17 A17
		The perimeter of the pentagon is $(x + 1) + (x + 2) + (x + 2) + (2x + 3) + 2 = 5x + 10$	M1	
		Perimeter of quadrilateral = 3 \times perimeter of pentagon $\therefore 16x + 13 = 3(5x + 10)$ [expand and simplify]	M1	
		$16x + 13 = 15x + 30$ $[-15x]$ $x + 13 = 30$ $[-13]$ $x = 17$	M1	
		Substitute $x = 17$ into expression for quadrilateral perimeter $16x + 13 \rightarrow (16 \times 17) + 13 = 272 + 13$	M1	
		$= 285 \text{ cm}$	A1	
Total Marks: 100				