Edexcel Practice GCSE Examination Paper Foundation Set 2 Paper 1 Non-Calculator	Solutions

Qu №	Answer	Solutions	Marks		AO	Spec.
1	2800	To round to nearest 100 look at 10s place value: 27**8**4; 8 is more than 5 so round up by increasing 100s value by 1 and reducing all values after to zero: 2784 → 2800	B1	**1**	1.3a	N15
2a	$5b$	$b+b+b+b+b=5\times b=5b$	B1		1.3a	A1
b	f^5	$f\times f\times f\times f\times f=f^{1+1+1+1+1}=f^5$	B1	**2**	1.3a	A1
3	Any even multiple of 9 e.g. 18 or 36	Multiples of 9: 9, 18, 27, 36, 45… Even numbers are exactly divisible by 2. **e.g.** 18 (18 ÷ 2 = 9)	B1oe	**1**	1.2	N1
4	<table><tr><th>Minutes</th><th>Hours</th></tr><tr><td>30</td><td>$\frac{1}{2}$</td></tr><tr><td>240</td><td>4</td></tr><tr><td>20</td><td>$\frac{1}{3}$</td></tr></table>	1 hour = 60 minutes 4 hours = 4 × 60 = 240 minutes 20 minutes = $\frac{20}{60}=\frac{2}{6}=\frac{1}{3}$ hour	A1 A1	**2**	1.3a	R1
5	3720	$0.93\times4000=$ <table><tr><td>×</td><td>4000</td></tr><tr><td>0.9</td><td>3600</td></tr><tr><td>0.03</td><td>120</td></tr></table> $\rightarrow 3600+120=3720$	A1	**1**	1.3a	N2
6	753, 735, 537, 573, 357, 375		B1	**1**	1.3a	N2 N5
7	7 [allow 6–7]	Estimate answer by rounding. **e.g.** Round to nearest whole number: 6.**6** → 7, 14.**2** → 14, 3.**05** → 3 Use rounded values to estimate answer: $\frac{6.6+14.2}{3.05}\approx\frac{7+14}{3}$ $=\frac{21}{3}=7$	M1evidence of estimation A1or other correct estimation	**2**	1.3a	N14
8a	5 hours & 45 minutes or $5\frac{3}{4}$ hours	The flight leaves at 16:55 and arrives at 22:40 The total journey time is 5 hours and 45 minutes	A1		1.3a	R1
b	Charlotte is wrong [with reason]	***Reason must be seen*** The flight leaving at 15:50 and arriving at 19:00 has no stops. The total journey time is 2 hours & 10 minutes. The flight leaving at 14:45 and arriving at 16:45 has no stops. The total journey time is 2 hours & 10 minutes. The flight leaving at 19:05 and arriving at 21:40 has no stops. The total journey time is 2 hours and 35 minutes. 2 hours and 35 minutes is longer than 2.5 hours ∴ Charlotte is wrong.	A1	**2**	2.4a	R1
9	(–5, 3)	Given co-ordinate is (2, –4) Sides of the square are 7 units long A is 7 units left and 7 units up from the given co-ordinates. x co-ordinate of A is 2 – 7 = –5 y co-ordinate of A is –4 + 7 = 3 Co-ordinates of A are (–5, 3)	M1 subtracting 7 from x co-ordinate or adding 7 to y co-ordinate A1	**2**	2.1a 3.1a	A8 G4

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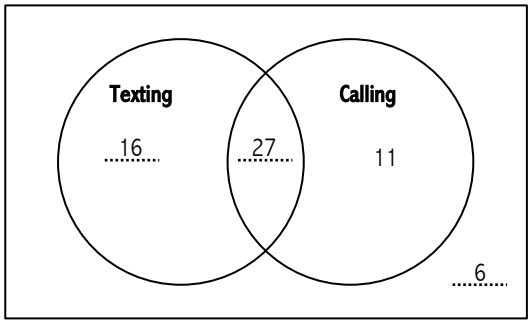
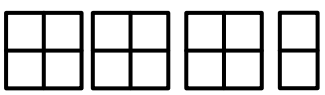
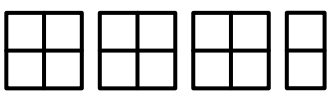
Qu №	Answer	Solutions	Marks		AO	Spec.
10		60 people in survey; Calling: 38 people; Texting: 43 people; Calling only: 11 people Texting & Calling: $38 - 11 = 27$ people Texting only: $43 - 27 = 16$ people Neither Texting nor Calling: $60 - 11 - 27 - 16 = 6$ people  	A1 27 in intersection A1 16 in texting circle A1 6 outside circles	3	2.3a 2.3b	P6
11	8.8 & 2.8 7.5 & 4.1	Write the numbers in order: 2.8, 4.1, 7.5, 8.8, 9.9 Largest number 9.9, smallest number 2.8 $9.9 + 2.8 = 12.7$ No other numbers large enough to make 12.7 so 9.9 can be discounted $8.8 + 2.8 = 11.6$ [largest remaining number with smallest number] $7.5 + 4.1 = 11.6$ $\therefore$ the pairs are 8.8 & 2.8, and 7.5 & 4.1	M1 M1 accept any other logical step A1 both pairs correct	3	1.3b	N1 N2
12a	$\frac{5}{6}$	$\frac{15}{6} - \frac{5}{3}$ [write fractions with a common denominator] $= \frac{15}{6} - \frac{(5\times2)}{(3\times2)} = \frac{15}{6} - \frac{10}{6}$ $= \frac{(15-10)}{6}$ [subtract numerators & place over denominator] $= \frac{5}{6}$	M1 for common denominators A1		1.3a	N2 N8
b	$\frac{14}{9}$ or $1\frac{5}{9}$	$\frac{2}{3} \div \frac{3}{7}$ [flip the second fraction and multiply] $= \frac{2}{3} \times \frac{7}{3}$ [multiply the numerators together and the denominators together] $\frac{2}{3} \times \frac{7}{3} = \frac{(2\times7)}{(3\times3)}$ [simplify] $= \frac{14}{9}\left[= 1\frac{5}{9}\right]$	M1 flip second fraction and multiply A1	4	1.3a	N2 N8
13a	23	Number of people who listen to the radio is 23	A1		2.3a	S2
b	13	Number of people who listen to music on CDs is 18 Number of people who listen to music on tapes is 5 $18 - 5 = 13$ more people listen to music on CDs than on tapes	A1		2.3a 1.3a	S2
c		23 people listen to the radio 18 people listen to CDs 5 people listen to tapes Pictogram represents data from 60 people $\therefore$ number of people who listen to music using their phone is $60 - 23 - 18 - 5 = 14$ This is represented by: 	M1 A1	4	2.3a 1.3a 2.3b	S2

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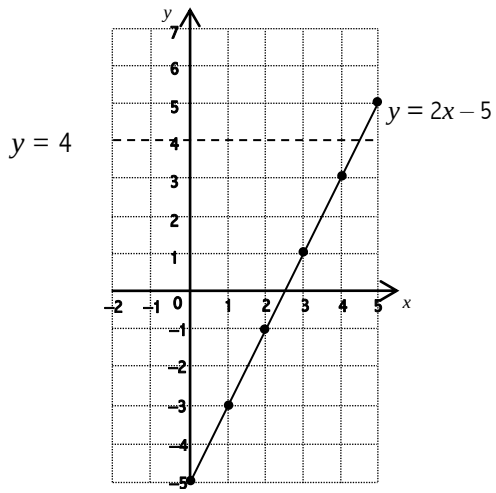
Qu №	Answer	Solutions		Marks		AO	Spec.
14a	0.4	Only 1 ribbon colour can be taken out at a time ∴ events are mutually exclusive & the probabilities sum to 1 P(Blue) = 1 − 0.25 − 0.3 − 0.05 = 0.4		B1		1.3a	P4
b	0.55	P(Red) = 0.25; P(Green) = 0.3 P(Red or Green) = 0.25 + 0.3 = 0.55		M1 summing probabilities A1	**3**	1.3a	P4
15	12.2 ± 0.4 km	1 cm represents 2 km On the diagram, the distance between the two towns is 6.1 ± 0.2 cm This represents a distance of 6.1× 2 = 12.2 ± 0.4 km	**A5 version:** 4.3 cm (accept 4.1 to 4.4 cm) 4.3 × 2 8.6 km (accept 8.2 to 8.8 km)	M1 A1	**2**	2.3a 1.3b	R2
16	$6n-2$	n: 1, 2, 3, 4 — Term: 4, 10, 16, 22 (+6 +6 +6) The common difference between terms is 6 so find $6n$ values $6n$: 6, 12, 18, 24 — Term: 4, 10, 16, 22 (−2) The difference between $6n$ values & the terms is −2, so the n^{th} term is $6n-2$		M1 method to find the n^{th} term; $6n + x$ A1	**2**	2.1a 1.3a	A25
17a		x: 0, 1, 2, 3, 4, 5 — $y=2x-5$: **−5**, −3, **−1**, 1, **3**, **5**		B1 2 correct answers B1 all correct answers		1.3a	A2
b				M1 2 correctly plotted points C1 correct line		2.3a 2.3b	A9
c	$x=4.5=\frac{9}{2}$	**Either:** Draw the line $y=4$ on the graph The 2 lines meet at (4.5, 4) so the solution to $2x-5=4$ is $x=$ 4.5	**Or:** $2x-5=4$ [+5] $2x=9$ [÷2] $x=\frac{9}{2}=4.5$	M1 A1	**6**	2.3a	A17
18a	$8(x+2)$	HCF of $8x$ & 16 = 8, 8 goes outside the brackets: $8x+16=8(x+2)$		B1		1.3a	A4
b	$a(a+8)$	HCF of a^2 & $8a = a$, a goes outside the brackets: $a^2+8a=a(a+8)$		B1	**2**	1.3a	A4

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Qu №	Answer	Solutions	Marks		AO	Spec.
19a	35	7 instructors at the centre; ratio of instructors to adults is 1 : 5 Maximum number of adults on the beginners' climbing course is 7 × 5 = 35	A1		1.3a	R5
b	6	Ratio of instructors to adults is 1 : 5; Ratio of instructors to children is 1 : 3; 12 children & 9 adults booked on the course. Number of instructors needed for the 12 children is 12 ÷ 3 = 4	M1		3.1c 1.3b	R5
		Number of instructors needed for 9 adults is 9 ÷ 5 = 1.8 1.8 rounds up to 2 (cannot have less than a whole person and 1 is not enough)	M1			
		Total number of instructors needed is 4 + 2 = 6	A1	**4**		
20a	41	The number of people who get to work in 30 minutes or less is 8 + 18 + 15 = 41	A1		2.3a	S2
b	Any correct explanation involving grouped data	**e.g.** The time is **grouped data** so the actual maximum time taken to travel may not be 50 minutes, and the actual minimum time taken to travel may not be 5 minutes	A1	**2**	3.5	S2?
21	Shop B [with working]	***Working must be shown*** Shop A – buy one get one half price: 2 packs of biscuits costs 1.5 × cost of 1 pack 1 pack of biscuits costs (1.5 ÷ 2) × cost of 1 pack = 0.75 × cost of 1 pack	M1		2.1a 3.1c	R5
		Shop B – buy two get a third free: 3 packs of biscuits costs 2 × cost of 1 pack 1 pack of biscuits costs (2 ÷ 3) × cost of 1 pack = 0.666… × cost of 1 pack	M1			
		0.666… < 0.75 ∴ Shop B is cheaper per pack of biscuits	A1	**3**		

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Qu №	Answer	Solutions	Marks		AO	Spec.
22a	$\frac{1}{6}$	Total number of possible outcomes is 6; Number of times 3 can be rolled is 1 $P(3) = \frac{1}{6}$	A1		1.3a	P3
b		**Either:** Number of ways of scoring a total of 6 can be shown in a possibility space diagram or a list **e.g**				

	1	**2**	**3**	**4**	**5**	**6**
1	2	3	4	5	<u>6</u>	7
2	3	4	5	<u>6</u>	7	8
3	4	5	<u>6</u>	7	8	9
4	5	<u>6</u>	7	8	9	10
5	<u>6</u>	7	8	9	10	11
6	7	8	9	10	11	12

	The total number of possible outcomes is $6 \times 6 = 36$	M1		
	The total number of times it is possible to get a total of 6 is 5	M1		
	$P(\text{total of } 6) = \frac{5}{36}$	A1		3.1c 1.3b
	Or:	**Or:**		
	$P(1) = \frac{1}{6}; P(2) = \frac{1}{6}; P(3) = \frac{1}{6}; P(4) = \frac{1}{6}; P(5) = \frac{1}{6}$ $P(1 \text{ \& } 5) = \frac{1}{6} \times \frac{1}{6} = \frac{1}{36}; P(2 \text{ \& } 4) = \frac{1}{6} \times \frac{1}{6} = \frac{1}{36};$ $P(3 \text{ \& } 3) = \frac{1}{6} \times \frac{1}{6} = \frac{1}{36}; P(4 \text{ \& } 2) = \frac{1}{6} \times \frac{1}{6} = \frac{1}{36}$ $P(5 \text{ \& } 1) = \frac{1}{6} \times \frac{1}{6} = \frac{1}{36}$	M1		
	$P(\text{scoring a total of } 6) = \frac{1}{36} + \frac{1}{36} + \frac{1}{36} + \frac{1}{36} + \frac{1}{36}$	M1		
	$\frac{5}{36}$	$= \frac{5}{36}$	A1	**4**		P6 P7
23	$\begin{pmatrix} -2 \\ 4 \end{pmatrix}$	To get from the start of line **a** to the end of line **a** you move 2 units to the **left** and 4 units **up**. This is written as $\mathbf{a} = \begin{pmatrix} -2 \\ 4 \end{pmatrix}$	A1	**1**	2.3a	G25
24	1.6×10^8	$(8 \times 10^4) \times (2 \times 10^3) = 8 \times 10^4 \times 2 \times 10^3$ $= (8 \times 2) \times (10^4 \times 10^3) = (8 \times 2) \times 10^{4+3} = 16 \times 10^7$	M1		1.3a	N9
		$= 1.6 \times 10^8$ [in standard form]	A1	**2**		
25	$x = 21$	Angle CAB = angle ECD [corresponding angles] $5x - 18 = 4x + 3$ [+ 18]	M1		3.1a 1.3b 3.2	G3 A17
		$5x = 4x + 21$ [$- 4x$]	M1			
		$x = 21$	A1	**3**		

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Qu №	Answer	Solutions	Marks		AO	Spec.
26	17	Let the input of A = a & the input of B = b. Machine A: $2a - 7$ = Output; Machine B: $3b + 8$ = Output	M1 equations formed		1.3b	A2 A17
		Machines have same output so $2a - 7 = 3b + 8$ (1)	M1 equated equations			
		The input of A is 4 times the input of B, so $a = 4 \times b = 4b$ $2a - 7 = 3b + 8$ [substitute in $a = 4b$ into (1)] $(2 \times 4b) - 7 = 3b + 8$ [simplify] $\rightarrow 8b - 7 = 3b + 8$ [$-3b$] $5b - 7 = 8$ [$+7$] $5b = 15$ [$\div 5$] $b = 3$	M1 solving for 'their b'			
		Find the output: $3b + 8 = x$ [substitute in $b = 3$]	M1 substituting			
		$(3 \times 3) + 8 = x$ [simplify] $\rightarrow x = 9 + 8 = 17$	A1	**5**		
		Check: $a = 4b = 4 \times 3 = 12$ Substitute a into its number machine to check output is the same: $2a - 7 \rightarrow (2 \times 12) - 7 = 24 - 7 = 17$				
27	Rotation of 90° anticlockwise, or rotation of 270° clockwise, about the point (0, 0)	**Either:** The transformation which maps shape A onto shape B is a rotation of 90° anticlockwise. The centre of rotation is (0, 0).	**Or:** The transformation which maps shape A onto shape B is a rotation of 270° clockwise. The centre of rotation is (0, 0).	M1 two from 'rotation, 90°/ 270°, anticlockwise/ clockwise, about (0,0)' A1 complete answer	**2**	2.3b	G7
28a	**'Show That' Qu** ***working must be shown***	Area of a square = (side length)^2 Area of a rectangle = length × width Area of ABGH is $(x + 2)^2 = (x + 2)(x + 2) = (x^2 + 4x + 4)$ cm^2		M1		1.3b 2.2 2.4a	G16 G17 A4
		Area of BEFG is $(x + 2) \times 2 = 2(x + 2) = (2x + 4)$ cm^2		M1			
		Area of BCDE is $2^2 = 4$ cm^2 Total area of larger shape is $(x^2 + 4x + 4) + (2x + 4) + 4$		M1			
		$= x^2 + 6x + 12$		A1			
b	$x = 3$	Area of shape is 39 cm^2 $\therefore x^2 + 6x + 12 = 39$ $\therefore x^2 + 6x + 12 = 39$ [-39] $x^2 + 6x - 27 = 0$ [factorise]		M1		1.3b	A18
		$(x + 9)(x - 3) = 0$ $(x + 9) = 0$ or $(x - 3) = 0$ $x = -9$ or $x = 3$ Side length cannot be a negative number $\therefore x = 3$		A1	**6**		

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Qu No	Answer	Solutions	Marks		AO	Spec.
29a	Step 1 [with explanation]	**e.g.** Rafael went wrong in step one because he added the values instead of multiplying them	A1		3.4a	A18
b		$(x+2)(x+5)=3(x+2)$ [expand brackets on LHS]				
		$\begin{array}{c\|c\|c} \times & x & 2 \\ \hline x & x^2 & 2x \\ \hline 5 & 5x & 10 \end{array}$ $2x=3(x+2)$				
		$x^2+7x+10=3(x+2)$ [expand brackets on RHS]				
		$x^2+7x+10=3x+6$ $[-3x]$	M1 expanding brackets on both sides		1.3b	A18
		$x^2+4x+10=6$ $[-6]$				
		$x^2+4x+4=0$ [factorise]	M1 making equation equal 0			
		$(x+2)(x+2)=0$	M1 factorising			
	$x=-2$	$x=-2$	A1	**5**		
				Total Marks: 80		

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