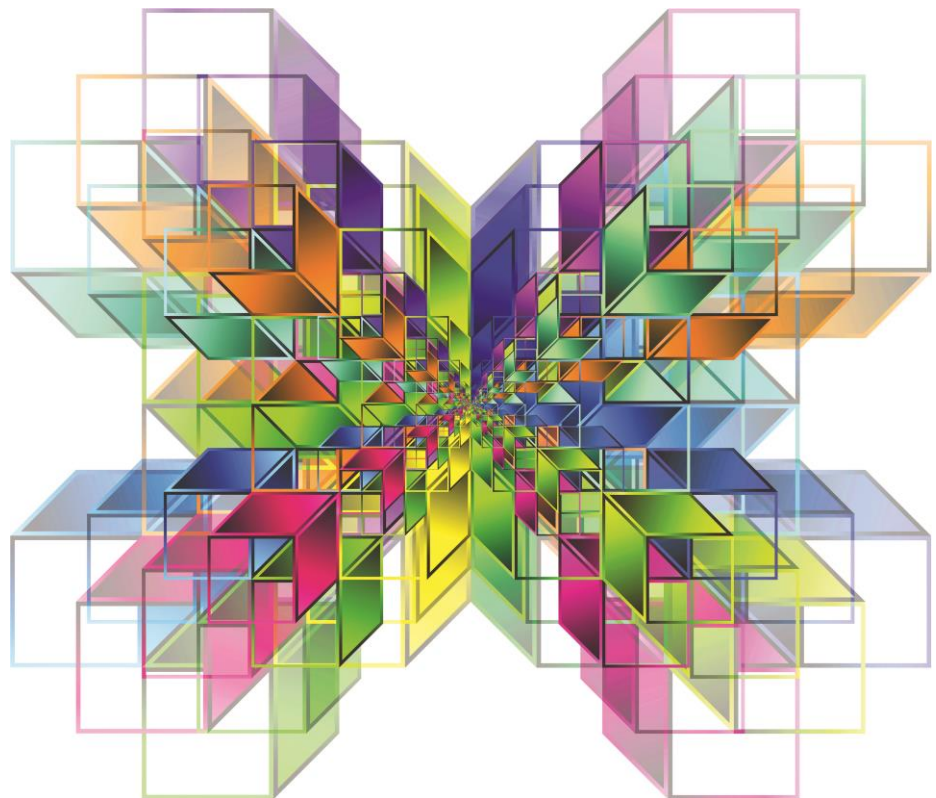


GCSE MATHS

Autumn hub network meeting

Questions and mark schemes

Published: Autumn 2019



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Paper 1F Q4

4 Circle the calculation which works out half of 12

[1 mark]

$12 \div 0.5$

$2 \div 12$

$12 \times \frac{1}{2}$

$12 \div 50 \times 100$

Marks	% at 5	% at 4	% at 3	% at 2	% at 1	% at U
1	83%	60%	34%	20%	18%	28%
0	17%	40%	65%	79%	80%	68%
Not attempted	0%	1%	1%	1%	2%	4%

Paper 1F Q4 mark scheme

4	$12 \times \frac{1}{2}$	B1	
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Paper 1F Q17

17 (a) Simplify fully 56 : 24

[2 marks]

17 (b) Write the ratio 5 : 4 in the form $n : 1$

[1 mark]

17 (c) Share £180 in the ratio 1 : 9

[2 marks]

Marks (1F Q17c)	% at 5	% at 4	% at 3	% at 2	% at 1	% at U
2	95%	85%	66%	34%	9%	1%
1	4%	8%	15%	20%	13%	3%
0	2%	7%	17%	36%	53%	52%
Not attempted	0%	0%	2%	9%	24%	44%

Paper 1F Q17 mark scheme

17(a)	28 : 12 or 14 : 6 or 56 ÷ 8 and 24 ÷ 8 (may be done in stages) or 3 and 7 seen	M1	
	7 : 3	A1	
17(b)	1.25 : 1	B1	oe eg $\frac{5}{4} : 1$
17(c)	180 ÷ (1 + 9) or 18 or 162	M1	
	18 and 162	A1	
	Additional Guidance		
	162 and 18		M1A0
	Build-up method will score 2 or 0 eg 1 : 9 2 : 18 does not score M1 for 18		

Paper 1F Q19b

19 You are given that $4a - 2b = 10$

19 (a) Write down the value of $2a - b$

[1 mark]

19 (b) Write down the value of $2b - 4a$

[1 mark]

Marks	% at 5	% at 4	% at 3	% at 2	% at 1	% at U
1	74%	57%	36%	16%	5%	1%
0	23%	37%	54%	68%	71%	64%
Not attempted	3%	5%	10%	17%	24%	34%

Paper 1F Q19b mark scheme

19(b)	-10	B1	
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Notes

Paper 2F Q6b

- 6 (a) Use your calculator to work out $\frac{9.75^3}{1.875} + 6.4^2$

Give your answer as a decimal.

Write down your full calculator display.

[2 marks]

- 6 (b) Is your answer to part (a) sensible?

Check by rounding each of 9.75, 1.875 and 6.4 to the nearest whole number.

You **must** show your working.

[3 marks]

Marks	% at 5	% at 4	% at 3	% at 2	% at 1	% at U
3	77%	63%	43%	19%	4%	0%
2	11%	12%	12%	7%	2%	0%
1	11%	21%	35%	48%	37%	10%
0	1%	4%	10%	23%	45%	59%
Not attempted	0%	0%	1%	3%	10%	21%

Paper 2F Q6b mark scheme

6(a)	494.325 or $\frac{19\,773}{40}$ or $494\frac{13}{40}$ or 40.96 or $\frac{1024}{25}$ or $40\frac{24}{25}$ or 535.29 or 535.3 or $\frac{107\,057}{200}$ or $535\frac{57}{200}$	M1	
	535.285	A1	
	Additional Guidance		
	Ignore any subsequent truncation or rounding if 535.285 seen in working		M1A1
6(b)	10^3 and 2 and 6^2 and 536 and indicates Sensible	B3ft	ft correct decision for comparing 536 with their 535.285 B2 10^3 and 2 and 6^2 seen B1 any two of 10, 2 and 6 seen allow 1000 to imply 10 or 10^3 and 36 to imply 6 or 6^2 for B1 or B2 only
	Additional Guidance		
	Students must give the correct ft decision for part (a) for B3		
	Correct decision for their (a) should be Sensible if their 535.285 is 530 or 540 to 2 sf. Otherwise they should indicate Not sensible		
	Condone eg 10.00 for 10 etc		

Paper 2F Q7

7 Complete the bank statement.

[3 marks]

Date	Description	Credit (£)	Debit (£)	Balance (£)
01/04/2019	Starting balance			_____
05/04/2019	Council tax		189.34	72.09
10/04/2019	Refund	_____		86.75
12/04/2019	Salary	1430.29		_____

Marks	% at 5	% at 4	% at 3	% at 2	% at 1	% at U
3	83%	68%	48%	25%	7%	1%
2	8%	11%	12%	10%	5%	1%
1	3%	6%	9%	11%	9%	5%
0	5%	12%	24%	39%	50%	44%
Not attempted	1%	3%	7%	15%	25%	39%

Paper 2F Q7 mark scheme

7	261.43	B1	in correct place																											
	14.66	B1	in correct place																											
	1517.04	B1	in correct place																											
	Additional Guidance																													
	<table><tr><th>Date</th><th>Description</th><th>Credit (£)</th><th>Debit (£)</th><th>Balance (£)</th></tr><tr><td>01/04/2019</td><td>Starting balance</td><td></td><td></td><td>261.43</td></tr><tr><td>05/04/2019</td><td>Council tax</td><td></td><td>189.34</td><td>72.09</td></tr><tr><td>10/04/2019</td><td>Refund</td><td>14.66</td><td></td><td>86.75</td></tr><tr><td>12/04/2019</td><td>Salary</td><td>1430.29</td><td></td><td>1517.04</td></tr></table>				Date	Description	Credit (£)	Debit (£)	Balance (£)	01/04/2019	Starting balance			261.43	05/04/2019	Council tax		189.34	72.09	10/04/2019	Refund	14.66		86.75	12/04/2019	Salary	1430.29		1517.04	B3
	Date	Description	Credit (£)	Debit (£)	Balance (£)																									
	01/04/2019	Starting balance			261.43																									
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	10/04/2019	Refund	14.66		86.75																									
	12/04/2019	Salary	1430.29		1517.04																									
Mark the table																														
Condone £ and p on values																														
Ignore working or values in shaded cells																														
−14.66				2nd B0																										

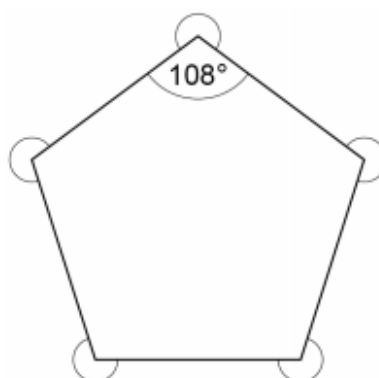
Paper 2F Q8a

- 8 (a) The interior angle of a regular pentagon is 108°

Work out the sum of the five **reflex** angles at the vertices of a regular pentagon.

[3 marks]

Not drawn
accurately



Marks	% at 5	% at 4	% at 3	% at 2	% at 1	% at U
3	80%	55%	29%	11%	2%	0%
2	1%	1%	1%	1%	0%	0%
1	12%	27%	40%	42%	32%	17%
0	6%	15%	25%	35%	42%	43%
Not attempted	0%	1%	4%	12%	21%	31%

Paper 2F Q8a mark scheme

8(a)	Alternative method 1		
	$360 - 108$ or 252	M1	oe eg $360 \div 5 + 180$ may be on diagram
	their 252×5	M1dep	oe eg $5 \times (180 - 108) + 5 \times 180$ or $5 \times 72 + 5 \times 180$ or $5 \times (72 + 180)$
	1260	A1	SC1 answer 540
	Alternative method 2		
	5×360 or 1800 and 5×108 or 540	M1	
	$5 \times 360 - 5 \times 108$ or $1800 - 540$	M1dep	oe
	1260	A1	SC1 answer 540
	Additional Guidance		
	Allow 252 seen on the diagram or in the working even if not used	M1	

Paper 2F Q12

- 12** A drawing has a scale of 1 : 40
On the drawing, a bedroom is a rectangle measuring 10 cm by 18 cm
A kitchen has an actual area of 300 000 cm²
Which has the bigger actual area, the kitchen or the bedroom?
You **must** show your working.

[4 marks]

Marks	% at 5	% at 4	% at 3	% at 2	% at 1	% at U
4	63%	35%	14%	3%	1%	0%
3	2%	1%	1%	0%	0%	0%
2	1%	1%	0%	0%	0%	0%
1	6%	10%	12%	7%	2%	0%
0	29%	50%	66%	72%	68%	55%
Not attempted	0%	3%	8%	17%	27%	35%

Paper 2F Q12 mark scheme

12	Alternative method 1		
	10 × 40 or 400 or 18 × 40 or 720	M1	
	10 × 40 × 18 × 40	M1dep	oe implies M2
	288 000	A1	implies M2A1
	Kitchen	A1ft	correct decision for their area with M2 awarded accept 300 000 for Kitchen
	Alternative method 2		
	10 × 18 or 180 and 40 ² or 1600	M1	oe 10 × 18 × 40 and 300 000 ÷ 40 implies M2
	10 × 18 × 40 ² or 10 × 18 and 300 000 ÷ 40 ²	M1dep	
	288 000 or 180 and 187.5 or 7200 and 7500	A1	implies M2A1
	Kitchen	A1ft	correct decision for their area with M2 awarded accept 300 000 for Kitchen

Continued overleaf

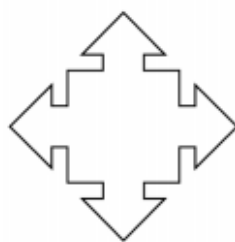
12 cont	Alternative method 3 (working in metres)		
	0.1 × 40 or 4 or 0.18 × 40 or 7.2	M1	
	0.1 × 40 × 0.18 × 40 or 28.8	M1dep	oe implies M2
	28.8 and 30	A1	implies M2A1
	Kitchen	A1ft	correct decision for their area with M2 awarded accept 300 000 for Kitchen
	Alternative method 4 (working in metres)		
	0.1 × 0.18 or 0.018 and 40 ² or 1600	M1	oe 0.1 × 0.18 × 40 and 30 ÷ 40 implies M2
	0.1 × 0.18 × 40 ² or 28.8 or 0.1 × 0.18 and 30 ÷ 40 ²	M1dep	
	28.8 and 30 or 0.018 and 0.01875 or 0.72 and 0.75	A1	implies M2A1
	Kitchen	A1ft	correct decision for their area with M2 awarded accept 300 000 for Kitchen
12 cont	Additional Guidance		
	288 000 and Kitchen	M1M1A1A1	
	288 000	M1M1A1	
	10 × 40 = 4000, 18 × 40 = 720 and 2 880 000 and Bedroom	M1M1A0A1ft	
	4000 and 720 and 2 880 000 and Bedroom (only 720 scores)	M1M0A0A0ft	
	Ignore any incorrect attempt to subtract 288 000 from 300 000		
	Any attempt to change units must be correct		
	NB 10 × 40 = 400, 10 × 18 = 180 400 × 180 = 72 000 and 300 000 – 72 000 = 228 000 and Kitchen	M1 M0A0A0	

Notes

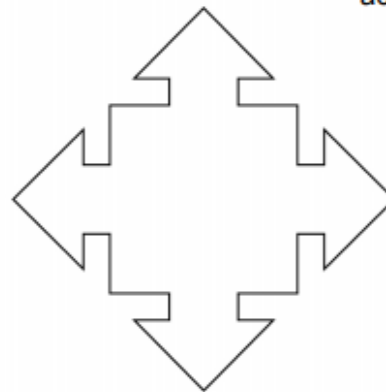
Paper 2F Q13

13 Here are two similar shapes, A and B.

Not drawn
accurately



A



B

length of edges in A : length of edges in B = 2 : 5

The perimeter of A is 210 mm

Work out the perimeter of B.

[2 marks]

Marks	% at 5	% at 4	% at 3	% at 2	% at 1	% at U
2	81%	58%	33%	14%	5%	3%
1	1%	1%	1%	0%	0%	0%
0	17%	39%	59%	70%	70%	57%
Not attempted	1%	3%	7%	15%	23%	31%

Paper 2F Q13 mark scheme

13	210 ÷ 2 × 5 or 105 × 5 or 1050 ÷ 2 or 210 : 525	M1	oe eg 210 × 2.5 or 420 + 105
	525	A1	
	Additional Guidance		
	Further work after reaching 525		M0A0

Paper 2F Q14a

14 There are 135 passengers on a plane.

3 of the passengers in Business Class are flying for the first time.

In total, there are 15 passengers in Business Class.

$\frac{1}{4}$ of the passengers **not** in Business Class are flying for the first time.

14 (a) In the Venn diagram,

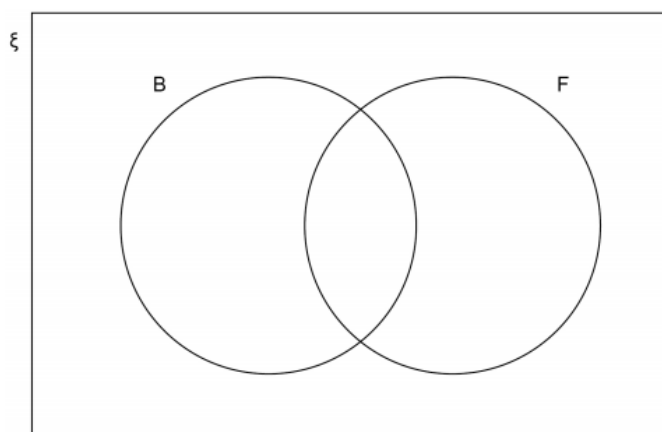
ξ = passengers on the plane

B = passengers in Business Class

F = passengers flying for the first time.

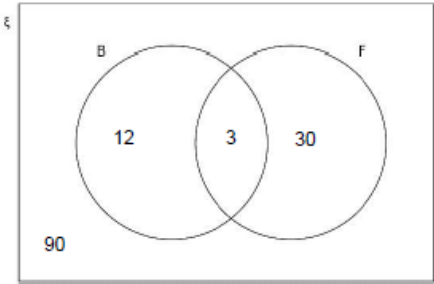
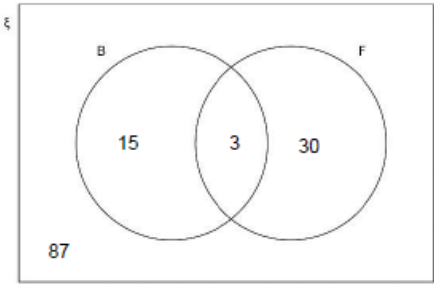
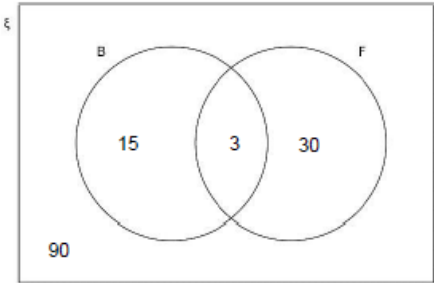
Complete the Venn diagram.

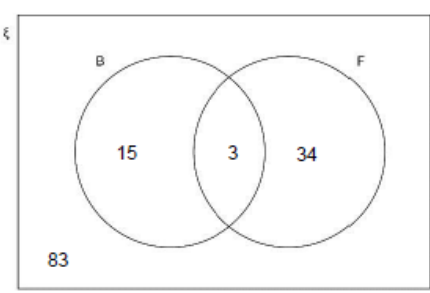
[4 marks]



Marks	% at 5	% at 4	% at 3	% at 2	% at 1	% at U
4	69%	49%	28%	10%	2%	0%
3	17%	24%	23%	14%	3%	0%
2	7%	14%	21%	22%	12%	3%
1	6%	10%	17%	25%	23%	9%
0	1%	4%	11%	25%	44%	48%
Not attempted	0%	0%	1%	3%	13%	31%

Paper 2F Q14a mark scheme

14(a)	3 in the intersection	B1	
	12 in the left hand part of B	B1	
	30 in the right hand part of F	B1	
	All four sections total 135	B1	must be using integers > 0 and have one integer in each of the four sections
	Additional Guidance		
	Mark the diagram		
	Ignore any correct or incorrect numbers on the diagram outside the rectangle eg 135		
			B1B1B1B1
			B1B0B1B1
			B1B0B1B0

14(a) cont		B1B0B0B1
	Two integers in one section is choice and doesn't score the mark for that section or the final mark	
	Condone multiple letters or tallies or crosses etc instead of numbers for all the marks	

Notes

Paper 2F Q17b

17 In a bag there are 10p coins, 20p coins and 50p coins.

There are two **fewer** 20p coins than 10p coins.

There are five **more** 50p coins than 10p coins.

17 (a) Complete the table.

[1 mark]

Coin	Number of coins
10p	n
20p	$n - 2$
50p	

17 (b) Altogether, there are 60 coins.

Work out the total **value** of the 20p coins.

[4 marks]

Marks	% at 5	% at 4	% at 3	% at 2	% at 1	% at U
4	64%	40%	20%	7%	1%	0%
3	6%	4%	3%	1%	0%	0%
2	8%	7%	4%	2%	1%	0%
1	3%	3%	2%	0%	0%	0%
0	18%	41%	59%	65%	61%	52%
Not attempted	2%	5%	13%	25%	35%	39%

Paper 2F Q17b mark scheme

17(b)	$n + n - 2 + \text{their } (n + 5)$ or $3n + 3$	M1	condone any letter ft their algebraic expression in (a)
	$3n + 3 = 60$ or $(n =) 19$ or $(n - 2 =) 17$	M1dep	ft their algebraic expression in (a) correct ft equation with terms on LHS collected 19 10p coins or 17 20p coins or 19, 17, 24 chosen implies M2
	$(\text{their } 19 - 2) \times 0.2$ or their 17×0.2 or 3.4 or $(\text{their } 19 - 2) \times 20$ or their 17×20 or 340	M1dep	ft their algebraic expression in (a) 3.4 or 340 implies M3
	3.40	A1	condone 3.40p SC2 answer 17
	Additional Guidance		
	Allow a restart in this part ie answer £3.40 scores full marks		
	Working may be seen by the table		
	Answer 340p		M1M1M1A0
	£3.40 with answer eg £17.30 (total of all coins)		M1M1M1A0
	Only follow through their algebraic expression from (a) if an expression and / or equation for the total number of coins is used in this part		
	Award the M mark(s) for a correct ft expression or equation even if not subsequently used		
	The solution to an equation derived from an incorrect expression in (a) can score the first three marks eg answer in (a) $n - 5$ then working in (b) $n + n - 2 + n - 5 = 60$ $n = [22, 23]$ $([22, 23] - 2) \times 0.2 = [4, 4.20]$		M1M1 M1A0

Paper 3F Q5

5 Put these numbers in order from smallest to largest.

$$\frac{31}{40}$$

$$\frac{3}{4}$$

$$\frac{7}{10}$$

0.725

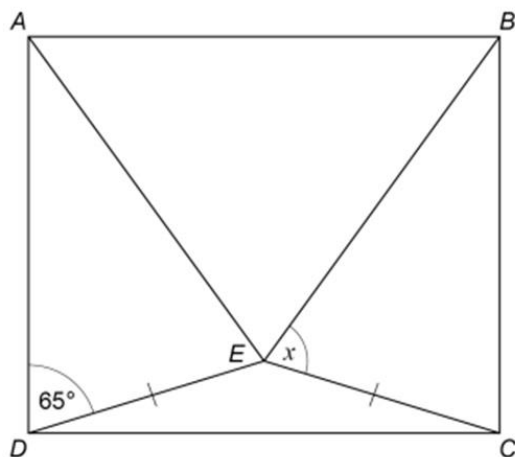
[2 marks]

Marks	% at 5	% at 4	% at 3	% at 2	% at 1	% at U
2	90%	77%	57%	31%	10%	1%
1	10%	21%	34%	43%	33%	9%
0	1%	2%	9%	24%	49%	67%
Not attempted	0%	0%	0%	1%	2%	6%

Paper 3F Q5 mark scheme

5	<p>Correct conversion to a comparable form</p> <p>$(\frac{31}{40} =) 0.775$</p> <p>or</p> <p>$(\frac{3}{4} =) \frac{30}{40}$ or 0.75</p> <p>or</p> <p>$(\frac{7}{10} =) \frac{28}{40}$ or 0.7</p> <p>or</p> <p>$(0.725 =) \frac{29}{40}$</p> <p>or</p> <p>any two of 77.5(%), 75(%), 70(%), 72.5(%)</p>	M1	
	<p>$\frac{7}{10}$</p> <p>0.725</p> <p>$\frac{3}{4}$</p> <p>$\frac{31}{40}$</p> <p>with no incorrect working</p>	A1	<p>oe</p> <p>accept in converted form</p>
	Additional Guidance		
	<p>Two correct conversions using fractions with common denominators other than 40</p> <p>eg $\frac{124}{160}$ and $\frac{120}{160}$</p>	M1	
	<p>Correct order with incorrect working</p> <p>$\frac{31}{40} = 0.925$, $\frac{3}{4} = 0.75$, $\frac{7}{10} = 0.7$</p> <p>$\frac{7}{10}$, 0.725, $\frac{3}{4}$, $\frac{31}{40}$</p>	M1A0	

Paper 3F Q10



- 10** In rectangle $ABCD$
 triangle ABE is equilateral
 triangle CDE is isosceles, with $CE = DE$

Work out the size of angle x .

[4 marks]

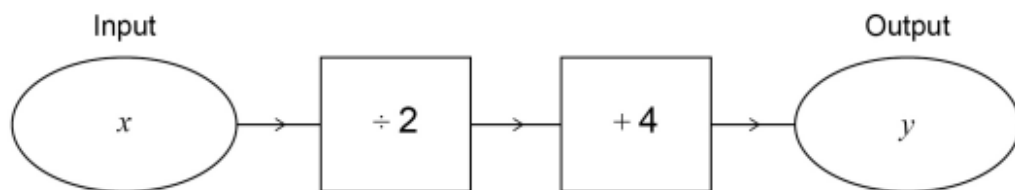
Marks	% at 5	% at 4	% at 3	% at 2	% at 1	% at U
4	74%	43%	18%	5%	1%	0%
3	1%	1%	0%	0%	0%	0%
2	12%	17%	14%	7%	2%	1%
1	10%	22%	25%	16%	4%	1%
0	3%	15%	36%	57%	64%	51%
Not attempted	0%	2%	6%	14%	24%	30%

Paper 3F Q10 mark scheme

10	Alternative method 1		
	$180 \div 3$ or 60	M1	
	$90 - \text{their } 60$ or 30	M1dep	
	$180 - 65 - \text{their } 30$	M1dep	85 marked on AED
	85	A1	
	Alternative method 2		
	$90 - 65$ or 25	M1	
	$180 - 2 \times (90 - 65)$ or 2×65 or $180 - 2 \times \text{their } 25$ or 130	M1dep	
	$(360 - (180 \div 3) - \text{their } 130) \div 2$ or $170 \div 2$	M1dep	85 marked on AED
	85	A1	
	Additional Guidance		
	Correct angles could be marked on diagram		
	85 on answer line with no working or angles marked on diagram		M1M1M1A1
	60, 30, 25 or 130 on answer line with no working and not marked correctly on diagram		M0
	On Alt 1, 60 with no working and incorrectly marked on diagram		M0

Paper 3F Q11b

11 (b) Write down the output y in terms of x .



[1 mark]

Marks	% at 5	% at 4	% at 3	% at 2	% at 1	% at U
1	64%	44%	25%	10%	3%	1%
0	35%	51%	65%	70%	65%	49%
Not attempted	1%	5%	11%	19%	27%	33%

Paper 3F Q11b mark scheme

11(b)	$(y =) \frac{x}{2} + 4$	B1	oe eg $(y =) 0.5x + 4$ or $(y =) \frac{x+8}{2}$
	Additional Guidance		
	Condone $x \div 2 + 4$		B1

Paper 3F Q13

13 Write down **all** the prime numbers between 40 and 50

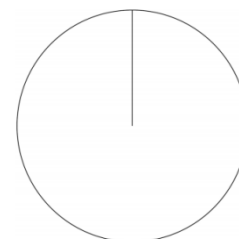
[2 marks]

Marks	% at 5	% at 4	% at 3	% at 2	% at 1	% at U
2	81%	64%	42%	20%	5%	1%
1	15%	22%	25%	21%	11%	2%
0	4%	12%	26%	44%	56%	49%
Not attempted	1%	2%	7%	14%	23%	32%

Paper 3F Q13 mark scheme

13	41, 43 and 47	B2	B1 at least two of 41, 43 and 47 with at most one other number
	Additional Guidance		

Paper 3F Q17b



- 17 (b)** In one hour the shop sells 180 scoops of ice cream.
The number of scoops of each flavour is shown in the table.

Flavour	Vanilla	Strawberry	Chocolate	Mint
Number of scoops	45	75	50	10

Complete the pie chart to represent the data.

[4 marks]

Marks	% at 5	% at 4	% at 3	% at 2	% at 1	% at U
4	80%	56%	33%	12%	2%	0%
3	12%	17%	16%	10%	4%	1%
2	2%	4%	5%	4%	2%	1%
1	5%	12%	17%	19%	17%	10%
0	2%	10%	27%	50%	61%	51%
Not attempted	0%	1%	3%	5%	9%	19%

Paper 3F Q17b mark scheme

17(b)	Alternative method 1		
	360 ÷ 180 or 2	M1	implied by a correct angle or implied by a correctly drawn angle in pie chart ± 2°
	Any two of 45 × their 2 or 90° 75 × their 2 or 150° 50 × their 2 or 100° 10 × their 2 or 20°	M1dep	implied by any two correctly drawn angles in pie chart ± 2°
	Pie chart with four sectors drawn, two of which are correctly drawn with angles from 90°, 150°, 100° and 20°	M1dep	± 2° lines must be ruled
	Fully correct pie chart and sectors labelled with flavours	A1	± 2° lines must be ruled

17(b) cont	Alternative method 2		
	$45 \div 180 \times 100$ or 25% or $75 \div 180 \times 100$ or $41\frac{2}{3}\%$ or 42% or $50 \div 180 \times 100$ or $27\frac{7}{9}\%$ or 28% or $10 \div 180 \times 100$ or $5\frac{5}{9}\%$ or 6%	M1	oe
	Any two of $45 \div 180 \times 360$ or 90° $75 \div 180 \times 360$ or 150° $50 \div 180 \times 360$ or 100° $10 \div 180 \times 360$ or 20°	M1dep	implied by any two correctly drawn angles in pie chart $\pm 2^\circ$
	Pie chart with four sectors drawn, two of which are correctly drawn with angles from 90° , 150° , 100° and 20°	M1dep	$\pm 2^\circ$ lines must be ruled
	Fully correct pie chart and sectors labelled with flavours	A1	$\pm 2^\circ$ lines must be ruled
	Additional Guidance		
	All four sectors must be correctly labelled with letters or words for the accuracy mark		

Notes

Contact us

T: 0161 957 3852

E: maths@aqa.org.uk

8am–5pm Monday to Friday

aqa.org.uk