

1MA1 Practice papers Set 3: Paper 1F (Regular) mark scheme – Version 1.0

Question		Working	Answer	Mark	Notes
1.			$\frac{2}{5}, \frac{1}{2}, \frac{3}{5}, \frac{3}{4}$	3	M1 for correct method to change two fractions to marks or percentages or fractions with a common denominator or decimals with at least one conversion correct. M1 for correct method to change two fractions to marks or percentages or fractions with a common denominator or decimals with all conversions correct A1 for the correct order.
2.	(a)		(2, 3)	2	B1 cao
	(i)		(-3, 1)		B1 cao
	(ii)				
	(b)		Point plotted at (3, -4)	1	B1 cao
3.		$1000 \div 80$	12	3	P1 for working in consistent units with correct operation (maybe repeated subtraction from £10 or repeated addition to get to £10) P1 for 12.5 or 12 with remainder 4 A1 cao
4.	(a)		Four thousand, one hundred and seventeen	1	B1 for four thousand, one hundred and seventeen oe
	(b)		4100	1	B1 for 4100 in figures or words or 41 hundred

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Question		Working	Answer	Mark	Notes
5.	(a)		(1 A) (2 A) (6 A) (1 C) (2 C) (6 C) (1 E) (2 E) (6 E)	2	B2 for all 9 (no extras, ignore repeats) (B1 for at least 5 correct)
	(b)		$\frac{1}{9}$	2	M1 ft from (a) for denominator of '9' or numerator of 'number of outcomes including 2 and E' seen A1 cao OR M1 for $\frac{1}{3} \times \frac{1}{3}$ A1 cao
6.			No and e.g. £4.10, £4 or 10p	3	M1 for adding at least 3 of 1.25, 1.15, 85, 85 A1 for 4.1(0) or 410 C1 ft (dep on M1) for correct statement comparing £4 and their total (units must be given and correct) or for correct statement referring to difference e.g. 10p short (units must be given and correct) OR M1 for finding at least one difference between coins and costs e.g. $2 - 0.85 - 0.85$ or $1.15 - 1$ or $1.25 - 1$ A1 for 0.10 or 10 C1 ft (dep on M1) for correct statement referring to total difference units (must be given and correct) (SC : B1 for correct figures with no working e.g. £4.10 and £4 or 10p)

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Question		Working	Answer	Mark	Notes
7.	(a)		3 : 1	1	B1
	(b)		$\frac{1}{4}$	1	B1
	(c)		$\frac{31}{40}$	1	B1

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8.		0.6 is bigger than $\frac{2}{5}$	3	<p>M1 for 0.4 or 40% or fraction equivalent to $\frac{2}{5}$ with denominator = 10,15,20... OR 60% or $\frac{3}{5}$ or a fraction equivalent to $\frac{3}{5}$ with denominator = 10,15,20...</p> <p>A1 for two comparable figures</p> <p>e.g. (0.6) ,0.4 or 40% , 60% or $\frac{3}{5}$, $\left(\frac{2}{5}\right)$ or $\frac{6}{10}$, $\frac{4}{10}$ etc</p> <p>C1 (dep on M1) ft for correct statement from their figures</p> <p>OR</p> <p>M1 for a correct method involving shading or calculation e.g. drawing a rectangle 2 by 5 and shading 6 squares or 4 squares or correct method to find $\frac{2}{5}$ or 0.6 of a number</p> <p>A1 correct comparable figures e.g. two 2×5 rectangles, one with 4 squares shaded, one with 6 squares shaded or $\frac{2}{5} \times 20 = 8$ and $0.6 \times 20 = 12$</p> <p>C1 (dep on M1) ft for correct statement from their figures</p> <p>OR</p> <p>M1 $\frac{2}{5} < \text{half}$ or $0.6 > \text{half}$</p> <p>A1 $\frac{2}{5} < \text{half}$ and $0.6 > \text{half}$</p> <p>C1 (dep on M1) ft for correct statement from their figures</p>

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Question		Working	Answer	Mark	Notes
9.	(a)		4	1	B1 cao
	(b)	$14 - 4 - 8 = 2$	2	3	M1 for $4 \times 2 (=8)$ blue counters M1 for $14 - "8" - 4$ or $10 - "8"$ A1 cao OR M1 for $P(B) = 2 \times \frac{4}{14}$ oe ($= \frac{8}{14}$ oe) M1 for $1 - \frac{"8"}{14} - \frac{4}{14}$ oe or $P(Y) = \frac{2}{14}$ oe or $\frac{2}{14} \times 14$ oe A1 cao
10.	(a)		Trapezium	1	B1
	(b)		60	1	B1 for 60 ± 2
	(c)		obtuse	1	B1

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Question		Working	Answer	Mark	Notes
11.	(a)		08 50	1	B1 for 08 50 or 8 50 (am) or 10 to 9
	(b)	13 43 – 13 29	14	1	B1 cao
	(c)	e.g. HL to SC: 11 02 – 11 41 Visit (at least 3 hours) SC to HL: 15 16 – 15 49 [Note : there are 9 possible solutions]	A fully correct plan showing departure times and arrival times of the two bus journeys	4	B1 for a departure time of 08 02 or 09 04 or 10 12 or 11 02 from HL M1 (indep) for a correct arrival time at SC and a correct departure time from SC (or Cartbridge St) which allows for a stay of at least 3 hours in SC (the differencing does not have to be seen) OR for correctly adding 3 hours to a their arrival time at SC B1 for a departure time from SC of 13 20 (13 11 from CS) or 14 24 (14 14 from CS) or 15 16 (15 07 from CS) C1 (dep on M1) for a complete correct plan which includes the departure and arrival times of the two bus journeys [Note: bus departure times may be identified by their starting times. E.g. the 15 07 from Cartbridge Street would be acceptable for the identification of the bus which arrives a HL at 15 49]
12.	(a)		120	2	M1 4×30 A1 cao
	(b)		Tuesday 125 miles > 120 miles 200 km > 192 km	3	M1 for $200 \div 8 \times 5$ or “120” $\div 5 \times 8$ A1 for 125 or 192 or ft from “a” C1 (dep M1) Correct conclusion for their calculated figure with its correct units stated. of “125” <u>miles</u> and “a” miles or “192” <u>km</u> and 200 km

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Question		Working	Answer	Mark	Notes									
13.	(a)			1	B1 cao									
	(b)	<table border="0"> <tr> <td>4</td> <td>13</td> </tr> <tr> <td>10</td> <td>31</td> </tr> <tr> <td>25</td> <td>76</td> </tr> </table>	4	13	10	31	25	76	<table border="0"> <tr> <td>13</td> </tr> <tr> <td>31</td> </tr> <tr> <td>25</td> </tr> </table>	13	31	25	3	B3 all three entries correct or ft “13” with 31 and 25 [B1 one correct entry, ft “13”]
	4	13												
10	31													
25	76													
13														
31														
25														
(c)		$3n + 1$	2	M1 for $3n + a$ where a is an integer $\neq 1$ or $n=3n+1$ A1 for $3n + 1$										

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Question	Working	Answer	Mark	Notes
14.	<p>Acton after 24, 48, 72, 96, 120</p> <p>Barton after 20, 40, 60, 80, 100, 120</p> <p>LCM of 20 and 24 is 120</p> <p>9:00am + 120 minutes</p> <p>OR</p> <p>Acton after 24, 48, 1h 12 m,</p> <p>1h 36m, 2h</p> <p>Barton after 20, 40, 1 h, 1h 20m, 1h 40m, 2h</p> <p>LCM is 2 hours</p> <p>9:00am + 2 hours</p> <p>OR</p> <p>Times from 9:00am when each bus leaves the bus station</p> <p>Acton at 9:24, 9:48, 10:12, 10:36, 11:00</p> <p>Barton at 9:20, 9:40, 10:00, 10:20, 10:40, 11:00</p> <p>OR</p> <p>$20 = 2 \times 2 \times 5$</p> <p>$24 = 2 \times 2 \times 2 \times 3$</p> <p>$2 \times 2 \times 2 \times 3 \times 5 = 120$</p>	11:00 am	3	<p>M1 for listing multiples of 20 and 24 with at least 3 numbers in each list ; multiples could be given in minutes or in hours and minutes</p> <p>(condone one addition error in total in first 3 numbers in lists)</p> <p>A1 identify 120 (mins) or 2 (hours) as LCM</p> <p>A1 for 11:00 (am) or 11(am) or 11 o'clock</p> <p>OR</p> <p>M1 for listing times after 9am when each bus leaves the bus station, with at least 3 times in each list</p> <p>(condone one addition error in total in first 3 times after 9am in lists)</p> <p>A1 for correct times in each list up to and including 11:00</p> <p>A1 for 11:00 (am) or 11(am) or 11 o'clock</p> <p>OR</p> <p>M1 for correct method to write 20 and 24 in terms of their prime factors 2, 2, 5 and 2, 2, 2, 3</p> <p>(condone one error)</p> <p>A1 identify 120 as LCM</p> <p>A1 for 11:00 (am) or 11(am) or 11 o'clock</p>

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Question		Working	Answer	Mark	Notes
15.	(a)	$2x + 6y + 4x - 4y$	$6x + 2y$	2	M1 for $2x + 6y$ or $4x - 4y$ or $6x$ or $2y$ A1 for $6x + 2y$ [accept $2(3x + y)$]
	(b)	$2 \times 4 \times p - 3 \times 4 \times p \times q$	$4p(2 - 3q)$	2	B2 cao [B1 for $2p(4 - 6q)$ or $p(8 - 12q)$ or $4(2p - 3pq)$ or $2(4p - 6pq)$ or $4p(a + bq)$ where $a \neq 0$ and $b \neq 0$]
16.	(a)	$30 = 2 \times 3 \times 5$ $42 = 2 \times 3 \times 7$ HCF = 2×3	6	2	M1 for 30 or 42 written correctly as a product of prime factors or attempt to list the factors of 30 and 42 (at least 4 for each including 6) A1 for HCF = 6
	(b)	30, 60, 90, ... 45, 90, 135, ...	90	2	M1 for listing multiples of 30 and 45 (at least 60 and 90) or $2 \times 3 \times 5 \times 3$ A1 for LCM = 90 SC B1 for 210
17.		$2 \times 2 \times 2 = 8$ $8 \div 2 = 4$	4 cm^3	3	M1 for $2 \times 2 \times 2 \div 2$ oe or $1 + 1 + 0.5 + 0.5 + 0.5 + 0.5$ oe A1 cao B1 (indep) for cm^3

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18.			20	3	M1 for $330 \div 120 (= 2.75)$ or $200 \div 60 (= 3 \frac{1}{3})$ or $450 \div 180 (= 2.5)$ M1 for $450 \div 180 (= 2.5)$ AND $8 \times "2.5" (= 20)$ A1 cao OR M1 for $120 \div 8 (= 15)$ or $60 \div 8 (= 7.5)$ or $180 \div 8 (= 22.5)$ M1 for $330 \div (120 \div 8) (= 22)$ or $200 \div (60 \div 8) (= 26.6\dots)$ or $450 \div (180 \div 8) (= 20)$ A1 cao OR M1 for multiples of 120:60:180, e.g. 240:120:360 M1 for multiples linked to 450 and $8+8+4$ or scaling 2.5 oe A1 cao
19.	(a)		0.6	2	B1 for 0.6 in correct position on tree diagram
	(b)	$0.4 \times 0.3 =$	0.7, 0.3, 0.7	2	B1 for 0.7, 0.3, 0.7 in correct positions on tree diagram
			0.12	2	M1 for 0.4×0.3 oe or a complete alternative method ft from tree diagram A1 for 0.12 oe

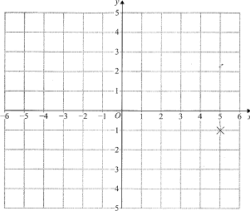
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20.	$2.25 \times 60 \div 100 = 1.35$ $1.35 + 0.80 = 2.15$ $1.5 \times 60 \div 100 = 0.90$ $0.90 + 1.90 = 2.80$	Railtickets with correct calculations	4	<p>NB. All work may be done in pence throughout</p> <p>M1 for correct method to find credit card charge for one company e.g. $0.0225 \times 60 (= 1.35)$ oe or $0.015 \times 60 (= 0.9)$ oe</p> <p>M1 (dep) for correct method to find total additional charge or total price for one company e.g. $0.0225 \times 60 + 0.80$ or $0.015 \times 60 + 1.90$ or 2.15 or 2.8(0) or 62.15 or 62.8(0)</p> <p>A1 for 2.15 and 2.8(0) or 62.15 and 62.8(0)</p> <p>C1 (dep on M1) for a statement deducing the cheapest company, but figures used for the comparison must also be stated somewhere, and a clear association with the name of each company</p> <p>OR</p> <p>M1 for correct method to find percentage of (60+booking fee) e.g. $0.0225 \times 60.8 (= 1.368)$ oe or $0.015 \times 61.9 (= 0.9285)$</p> <p>M1 (dep) for correct method to find total cost or total additional cost e.g. '1.368' + 60.8(= 62.168) or '1.368' + 0.8 (= 2.168) or '0.9285' + 61.9 (= 62.8285) or '0.9285' +1.9 (= 2.8285)</p> <p>A1 for 62.168 or 62.17 AND 62.8285 or 62.83 OR 2.168 or 2.17 AND 2.8285 or 2.83</p> <p>C1 (dep on M1) for a statement deducing the cheapest company, but figures used for the comparison must also be stated somewhere, and a clear association with the name of each company</p>

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		<p>OR</p> $2.25 - 1.5 = 0.75$ $0.075 \times 60 \div 100 = 0.45$ $0.80 + 0.45 = 1.25$ $1.25 < 1.90$			<p>OR</p> <p>M1 for correct method to find difference in cost of credit card charge e.g. $(2.25 - 1.5) \times 60 \div 100$ oe or 0.45 seen</p> <p>M1 (dep) for using difference with booking fee or finding difference between booking fees e.g. $0.80 + "0.45" (=1.25)$ or $1.90 - "0.45" (=1.45)$ or $1.90 - 0.8 (=1.1(0))$</p> <p>A1 1.25 and 1.9(0) or 0.45 and 1.1(0)</p> <p>C1 (dep on M1) for a statement deducing the cheapest company, but figures used for the comparison must also be stated somewhere, and a clear association with the name of each company</p> <p>QWC: Decision and justification should be clear with working clearly presented and attributable</p>
21.	(a)		3.85×10^{-3}	1	B1 cao
	(b)		729 100	1	B1 cao
	(c)		4×10^{11}	2	M1 for $2.4 \div 6 \times 10^{10--2}$ oe or $4(.0) \times 10^n$ or 4000 000 000 000 A1 cao
22.	(a)	$8.2 \times 10000 \div 100$	820	2	M1 for $8.2 (\pm 0.2) \times 10000 \div 100$ oe A1 for 800 – 840 (SC B1 for $8.2 (\pm 0.2) \times 10^n$, where $n \geq 1$, e.g. 82)
	(b)		130	1	B1 for 128 – 132

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Question		Working	Answer	Mark	Notes
1.		$1.85 \div 5 \times 9 =$	3.33	2	M1 for $1.85 \div 5$ or 1.85×9 or 0.37 or 16.65 or 333 seen A1 cao NB Working can be in £ or p
2.	(a)		37	1	B1 cao
	(b)		a	1	B1 cao
3.	(a)		(1, 2)	2	B1 (allow $(x = 1, y = 2)$)
	(i)		(-4, -3)		B1 (allow $(x = -4, y = -3)$)
	(ii)		plot(5, -1) on grid	1	B1 for plotting at (5, -1)
	(b)				
4.			0.6	3	B1 for 1.8 seen (accept 1800) M1 for “1.8” $\div 3$ A1 for 0.6 oe
5.	(a)		Cardiff	1	B1
	(b)		- 8	2	M1 for $- 3 - 5$ or $- 3 + - 5$ A1

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Question		Working	Answer	Mark	Notes
6.	(a)	$1.65 + 0.80$	2.45	2	M1 for $1.65 + 0.80$ or digits 245 seen A1 for 2.45 condone £2.45p
	(b)	$1.40 + 1.40 + 0.75 + 0.80$ $= 4.35$ $4.35 < 5.00$ or $5.00 - 4.35 = 0.65$ or rounded values used e.g. $1.50 + 1.50 + 1 + 1 = 5$ All rounded up so enough money	Yes	3	M1 for $1.40 + 1.40 + 0.75 + 0.80$ or 435 digits seen A1 for 4.35 or digits 65 C1 (dep on M1) based on their 4.35 OR M1 for addition of appropriately rounded prices A1 for correct total of rounded prices. C1 (dep on M1) Decision given – he has enough money
7.	(a)		1.3	1	B1 cao
	(b)		400	1	B1 cao
	(c)		25	2	M1 for $(90 \times 1000) \div (60 \times 60)$ A1 cao
8.	(a)	3 4 4 5 5 6 8 9 10	5	2	M1 for ordering the 9 numbers A1 cao
	(b)	$(4 + 8 + 5 + 9 + 10 + 5 + 6 + 3 + 4) \div 9$ $54 \div 9$	6	2	M1 for $(4 + 8 + 5 + 9 + 10 + 5 + 6 + 3 + 4) \div 9$ or $54 \div 9$ A1 cao
9.		$360 \div 120 \times 40$ 120, 72, 57, 111	pie chart	3	M1 method to find angle for any sector in pie chart M1 correct angles for sectors or two sectors drawn correctly A1 with angles 120, 72, 57, 111 and sectors labelled

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10.		3kg peaches is £1.68 £2.34 – £1.68 = £0.66 £0.66 ÷ 2 = £0.33	£0.33 or 33p	3	M1 $2 \times \text{£}0.84$ or digits 168 seen M1(dep) digits 234 – digits “168” or digits 66 seen A1 £0.33 or 33p (units consistent with answer) NB: 0.33 or 33 without units M2, £0.33p, £33p M2A1
11.	(a)		12	2	M1 for $9 \times 4 \div 3$ oe A1 cao
	(b)		6	3	M1 for a correct first step e.g. $20 \times 3 (= 60)$ or $20 \div 10 (= 2)$ or giving equation e.g. $10h \div 3 = 20$ M1 for complete method to give height e.g. ‘60’ ÷ 10 or ‘2’ × 3 or $h = 20 \times 3 \div 10$ oe A1 cao
12.		500×1.2 (oe) = 600 $600 \div 12 =$	50	4	M2 for $500 \times 1.2 (= 600)$ (oe) (M1 for $500 \times 0.2 (= 100)$ (oe)) M1 for $600 \div 12$ or $100 \div 12$ or $1.2 \div 12$ or $500 \div 12$ A1 cao SC: B2 for an answer of 8.33 or 8.34

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13.	(a)	$72 \div 9$ or 8 or $\frac{5}{9} \times 72$ or 5×72 or 360 or $0.555(5\dots) \times 72$ oe 8×5 or $360 \div 9$	40	2	M1 A1 cao
	(b)	$\frac{5}{15} + \frac{4}{15}$ or $\frac{5+4}{15}$	$\frac{9}{15}$	2	M1 for 2 fractions equivalent to $\frac{1}{3}$ and $\frac{4}{15}$ with a common denominator e.g. $\frac{15}{45} + \frac{12}{45}$ or $\frac{15+12}{45}$ A1 dep on M1 for fraction equivalent to $\frac{9}{15}$ (but not $\frac{3}{5}$) produced directly from M1
14.		Angle $ACB = 67^\circ$ $x = 180 - (67 + 67)$	46° with reasons	4	B1 for angle $ACB = 67^\circ$, could be marked on the diagram M1 for $180 - ('67' + '67')$ A1 for $x = 46^\circ$ C1 for vertically <u>opposite angles</u> (or <u>vertically opposite angles</u>) and base <u>angles</u> of an <u>isosceles</u> triangle are <u>equal</u> OR B1 for angle $ACB = 67^\circ$, could be marked on the diagram M1 for $180 - ('67' + '67')$ A1 for $x = 46^\circ$ C1 for “ <u>angles</u> on a straight <u>line</u> add up to <u>180°</u> and base <u>angles</u> of an <u>isosceles</u> triangle are <u>equal</u> ”

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15.		29.1	3	M1 use of cos M1 $\cos ("x") = (\text{= } 0.87\dots)$ or $(\text{"}x\text{"} =) \cos - 1 ()$ OR or M2 for sin and following correct Pythagoras or M2 for tan and following correct Pythagoras or correct Pythagoras and then correct use of sine or cosine rule with "21.36" A1 for ans rounding to 29.1 (29.1103...)	
16.	(a)	(I cost per nail) $1.36 \div 20 = 0.068,$ $3.30 \div 50 = 0.066,$ $6.03 \div 90 = 0.067$ (II e.g. number of nails for £1) $20 \div 1.36 = 14.7,$ $50 \div 3.30 = 15.1,$ $90 \div 6.03 = 14.9$ (III e.g. cost for 20 nails) $3.30 \div 50 \times 20 = 1.32,$ $6.03 \div 90 \times 20 = 1.34$ (IV using multipliers) $50 \div 20 = 2.5$ and $3.30 \div 1.36 = 2.42$ $90 \div 50 = 1.8$ and $6.03 \div 3.30 = 1.82$	Medium + reason	4	M1 for correct method to work out a unit cost for 2 boxes M1 for correct method to work out a unit cost for all 3boxes A1 for (£)0.068 and (£)0.066 and (£)0.067 oe C1 for correct conclusion based on their figures (consistent units) (dep on at least one M1 scored) OR M1 for correct method to work out the number of nails for £1oe from 2 boxes M1 for correct method to work out the number of nails for £1oe from all 3 boxes A1 for 14.7 and 15.1 and 14.9 C1 for correct conclusion based on their figures (consistent units) (dep on at least one M1 scored)
16 con t				OR M1 for correct method to work out the cost of 50 nails using the 20 nails cost oe	

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	(b)	<table border="1"> <tr><td>2</td><td>0 5 8</td></tr> <tr><td>3</td><td>0 0 0 5 7 9</td></tr> <tr><td>4</td><td>0 5 7 9</td></tr> <tr><td>5</td><td>0 5</td></tr> </table>	2	0 5 8	3	0 0 0 5 7 9	4	0 5 7 9	5	0 5	S&L diagram with key	3	<p>M1 for correct method to work out the cost of 50 nails using the 20 nails cost and 90 nails using the 20 nail cost</p> <p>A1 for (£1.36), (£)1.32, (£)1.34 oe</p> <p>C1 for correct conclusion based on their figures (dep on at least one M1 scored) (consistent units)</p> <p>OR</p> <p>M1 for correct method to compare multipliers for cost and number for 1 pair of boxes M1 for correct method to compare multipliers for cost and number for correct 2 pairs of boxes</p> <p>A1 for 2.5 and 2.42, 1.8 and 1.82</p> <p>C1 for correct conclusion based on their figures (dep on at least one M1 scored) (consistent units)</p> <p>M1 for correct stem and unordered leaves (condone two errors or omissions)</p> <p>A1 cao</p> <p>B1 for key, e.g. 2 0 means 20mm</p>
2	0 5 8												
3	0 0 0 5 7 9												
4	0 5 7 9												
5	0 5												
	(c)		37	1	B1 cao								

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17.	(a)	$x^2 + 9x - 3x - 27$	$x^2 + 6x - 27$	2	M1 for 3 out of 4 terms correct or 4 terms correct ignoring signs A1
	(b)	$v - u = at$	$a = \frac{v-u}{t}$ oe	2	M1 A1
18.			20	3	M1 for establishing the volume of the container is 500 cm^3 M1 for “500” $\div (5 \times 5)$ A1 cao
19.		$2000 \times 1.05^2 =$ 2000×1.1025 OR $2000 \times 1.05 = 2100$ $2100 \times 1.05 = 2205$	£2205	3	M2 2000×1.05^2 (M1 $2000 \times 1.05^n, n \neq 2$) A1 cao OR M1 $\frac{5}{100} \times 2000$ (oe) or 100 or 200 or 2100 or 2200 seen M1 (dep) $\frac{5}{100} \times (2000 + \text{“100”})$ A1 cao SC B2 for £2315.25 seen (3 yrs)
20.		$\frac{1}{2} (12 + 8) \times 6 = 60$ $\text{‘60’} \times 20 = 1200$ $1200 \times 5 = 6000$ $6000 \div 1000 = 6$	6	5	M1 $\frac{1}{2} (12 + 8) \times 6$ oe or 60 seen M1 (dep) $\text{‘60’} \times 20$ M1 (indep) $\text{‘1200’} \times 5$ A1 6000 cao A1 ft (dep on 1 st or 3 rd M1 scored) for 6

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Question	Working	Answer	Mark	Notes
21.		<p>“two angles are equal so the triangle is isosceles”</p>	5	<p>M1 for $6x - 10 + 4x + 8 + 5x + 2$ or $15x$ M1 for $6x - 10 + 4x + 8 + 5x + 2 = 180$ or $15x = 180$ or $(x =) 180 \div 15$ A1 $x = 12$ M1 (ft from '12' if M2 scored) for $5 \times '12' + 2$ or $6 \times '12' - 10$ or $62(^{\circ})$ or $4 \times '12' + 8$ or $56(^{\circ})$ C1 both base angles as 62 and two angles are equal so the triangle is isosceles NB. $x = 12$ with no working scores M0M0A0 ; correct value of x from clear trial and improvement could gain M1M1A1 OR M1 $5x + 2 = 6x - 10$ or $2 + 10 = 6x - 5x$ A1 $x = 12$ M1 $5 \times 12 + 2$ or $6 \times 12 - 10$ or $62(^{\circ})$ or $4 \times 12 + 8$ or $56(^{\circ})$ M1 checking their angles add to 180°, “62”+”62”+”56” = 180 C1 both base angles as 62 and two angles are equal so the triangle is isosceles OR M1 $4x + 8 = 5x + 2$ oe or $4x + 8 = 6x - 10$ A1 $x = 6$ or $x = 9$ M1 (dep) for substituting ‘x’ into one of the angles oe M1 for showing their angles do not sum to 180° C0</p>

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Question		Working	Answer	Mark	Notes
1.	(i)		9	1	B1
	(ii)		19	1	B1
	(iii)		27	1	B1
2.		$17 - 5 = 12$ $12 \div 2 =$ $2x + 5 = 17$ $2x = 17 - 5$	6	3	M1 $17 \div 2 (= 8.5)$ or $17 - 5 (= 12)$ M1 for correct order of operations -5 then $\div 2$ A1 cao Alternative M1 for forming the equation $2x + 5 = 17$ M1 for attempt to subtract 5 from both sides or divide both sides by 2 as the first step A1 cao NB For solutions involving trial and improvement award 3 marks (B3) for the correct answer of 6 but 0 marks for method; embedded solutions get 2 marks as long as the equation or working is complete.
3.	(a)(i)		unlikely	3	B1 cao
	(ii)		evens		B1 cao
	(iii)		impossible		B1 cao
	(b)		A,A,A,A,B,B,C,D	2	M1 for the same number of Cs and Ds OR twice as many As as Bs. A1 cao
4.			Correct line	2	B1 line drawn parallel to AB B1 line the same length as AB

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Question		Working	Answer	Mark	Notes
5.	(a)	$\frac{40}{100} \times 20$	8	2	M1 $\frac{40}{100} \times 20$ oe A1
	(b)	43%, 42.8%, 43.8%, 43.75%	$\frac{3}{7}$ 0.43 $\frac{7}{16}$ 43.8%	2	M1 Convert at least 2 of the 3 correctly to percentages or decimals A1 correct order. Accept written in any correct form. SC: Award B1 (1 mark only) if ordered largest to smallest
6.	(a)		$2 \times 2 = 4$	1	B1
	(b)		No with reason	1	C1 E.g. No - 6 is the lowest number
7.	(a)		$20 - t$	1	B1 for $20 - t$
	(b)		$4x + 20y$	2	B2 for $4x + 20y$ (B1 for $4x$ or $20y$)

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Question	Working	Answer	Mark	Notes																				
8.	<table border="1"> <thead> <tr> <th></th> <th align="center">Bus</th> <th align="center">Pre</th> <th align="center">Ec</th> <th align="center">Total</th> </tr> </thead> <tbody> <tr> <td align="center">M</td> <td align="center">(30)</td> <td align="center">28</td> <td align="center">34</td> <td align="center">(92)</td> </tr> <tr> <td align="center">F</td> <td align="center">14</td> <td align="center">32</td> <td align="center">(62)</td> <td align="center">108</td> </tr> <tr> <td align="center">Total</td> <td align="center">(44)</td> <td align="center">(60)</td> <td align="center">96</td> <td align="center">(200)</td> </tr> </tbody> </table> <p>() value given</p>		Bus	Pre	Ec	Total	M	(30)	28	34	(92)	F	14	32	(62)	108	Total	(44)	(60)	96	(200)	28	4	<p>M1 for total female passengers $200 - 92$ or 108 seen; or for total Economy passengers $200 - 44 - 60$ or 96 seen.</p> <p>M1 for male passengers in Economy “96” – 62 or 34 seen; or for female Premium “108” – $62 - (44 - 30)$ or 32 seen</p> <p>M1 for $92 - 30 - “34”$ or for $60 - “32”$</p> <p>A1 cao</p> <p>OR</p> <p>Answers may appear in a two-way table with no other method seen</p> <p>B1 for Female total 108 or Total Economy 96</p> <p>M1 for “96” – 62 or 34 seen in Male Economy; or “108” – $62 - (44 - 30)$ or 32 seen in Female Premium</p> <p>M1 for $92 - 30 - “34”$ or for $60 - “32”$</p> <p>A1 cao</p>
	Bus	Pre	Ec	Total																				
M	(30)	28	34	(92)																				
F	14	32	(62)	108																				
Total	(44)	(60)	96	(200)																				

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Question	Working	Answer	Mark	Notes																
9.	$y = \frac{1}{2}x + 3$ <table border="1" data-bbox="427 483 974 576"> <tr> <td>x</td> <td>-2</td> <td>-1</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>y</td> <td>2</td> <td>2.5</td> <td>3</td> <td>3.5</td> <td>4</td> <td>4.5</td> <td>5</td> </tr> </table>	x	-2	-1	0	1	2	3	4	y	2	2.5	3	3.5	4	4.5	5	<p align="center">Correct line from (-2, 2) to (4, 5)</p>	3	<p>(Table of values / calculation of values) M1 for at least 2 correct attempts to find points by substituting values of x. M1 ft for plotting at least 2 of their points (any points plotted from their table must be correctly plotted) A1 for correct line between $x = -2$ and $x = 4$</p> <p>(No table of values) M1 for at least 2 correct points with no more than 2 incorrect points plotted M1 for at least 2 correct points (and no incorrect points) plotted OR line segment of $y = \frac{1}{2}x + 3$ drawn A1 for correct line between $x = -2$ and $x = 4$</p> <p>(Use of $y = mx + c$) M1 for line drawn with gradient of $\frac{1}{2}$ OR line drawn with a y intercept of 3 M1 for line drawn with gradient of $\frac{1}{2}$ AND line drawn with a y intercept of 3 A1 for correct line between $x = -2$ and $x = 4$</p> <p>SC : B2 for correct line from $x = 0$ to $x = 4$</p>
x	-2	-1	0	1	2	3	4													
y	2	2.5	3	3.5	4	4.5	5													

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Question		Working	Answer	Mark	Notes
10.	(a)		360	2	M1 $30 \div 10 (= 3)$ or $120 \div 10 (= 12)$ or $120 + 120 + 120$ oe A1 cao
	(b)		25	2	M1 for $\frac{750}{300} (= 2.5)$ oe A1 cao
11.			160	3	M1 for $360 \div (1 + 3 + 5) (= 40)$ M1 (dep) for $5 \times '40' (= 200)$ A1 cao OR M1 for $360 \div (1 + 3 + 5) (= 40)$ M1 (dep) for $5 - 1 (= 4)$ A1 cao

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Question		Working	Answer	Mark	Notes
12.	(a)	$5 \times 2 - 3$	7	2	M1 for 5×2 or $5 - 2$ or $5 \times 2 - 3$ A1 cao
	(b)	$(17 + 3) \div 2$	10	2	M1 for $17 + 3$ or $(17 \pm 3) \div 2$ or $\frac{17}{2} \pm 3$ A1 cao
	(c)	$2 \times m - 3$	$2m - 3$	2	M1 for $2 \times m$ or $m - 3$ or $b \times m - 3$ A1 for $2m - 3$ oe NB If additional variable is introduced as subject then ignore. If $2m - 3 = k$ where k is a number then ignore k
	(d)	$(n + 3) \div 2$	$\frac{n + 3}{2}$	2	M1 for $n + 3$ or $\frac{n \pm 3}{2}$ oe or $n + 3 \div 2$ or $\frac{n}{2} \pm 3$ or for a reverse flow chart with at least one correct inverse process identified A1 for $\frac{n + 3}{2}$ oe NB If additional variable is introduced as subject then ignore. If $\frac{n + 3}{2} = k$ where k is a number then ignore k

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Question	Working	Answer	Mark	Notes
13.	$4 + 3 + 3 = 10$ $33 + 42 + 6 = 81$ $81 - 60 = 21$ $10 + 1 = 11$ OR $4:33 = 273 \text{ secs}$ $3:42 = 222 \text{ secs}$ $3.06 = 186 \text{ secs}$ $273 + 222 + 186 = 684$ $15:00 - 11:21$ or $900 - 684$	3 minutes 39 seconds	4	M1 for attempting to add minutes or seconds or 684 or 1081 or 1121 seen M1 for a conversion at any stage using 60 (indep) e.g. $4 \times 60 + 33$, or 10 minutes 81 seconds or $81 \div 60$ M1 for attempting to subtract "total time" from 15 minutes $1500 - 1121$ or $15.00 - 1081$ or $900 - 684$ A1 cao.

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Question		Working	Answer	Mark	Notes
14.	<i>(a)</i>	$28 \times 0.50 + 32 \times 0.72 +$ $50 \times 1.04 + 18 \times 1.51$ $14.00 + 23.04 + 52 +$ 27.18	£ 116.22	3	M1 at least one fx where the fs are correct M1 $\sum fx$ where the fs are correct A1 cao
	<i>(b)</i>	$32 \times (50 - 40) +$ $40 \times (72 - 59) +$ $68 \times (104 - 85) +$ $34 \times (151 - 123)$ $320 + 520 + 1292 + 952$ $= 3084$ OR $32 \times 50 +$ $40 \times 72 +$ $68 \times 104 +$ $34 \times 151 -$ $(32 \times 40 + 40 \times 59 +$ $68 \times 85 + 34 \times 123)$	£30.84	4	M1 attempts to find differences in costs M1 $\sum f \times \text{diff}$ A1 cao C1 Correct conclusion for their working, placed in a sentence and supported by their calculations provided at least one M1 awarded OR M1 $\sum fx$ for first class and second class M1 attempts to find difference between two totals A1 cao C1 Correct conclusion for their working, placed in a sentence and supported by their calculations provided at least one M1 awarded

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Question		Working	Answer	Mark	Notes
15.	(a)		-1, 0, 1, 2, 3	2	B2 for all 5 values and no extras (ignore repeats) (B1 for 4 correct values and no extras or all 5 correct values and one incorrect value)
	(b)	$x + x + 9 < 60$ $2x < 51$ $x < 25.5$	25	3	M1 for $x + x + 9$ oe A2 cao (A1 for 25.5) OR M1 for $60 \div 2 (=30)$ and $9 \div 2 (=4.5)$ A2 cao (A1 for 25.5) OR M1 for $60 - 9 (=51)$ and “51” $\div 2 (=25.5)$ A2 cao (A1 for 25.5) OR M1 for at least 2 trials with correct totals A2 cao (A1 for correct trial of 25 and 26)
16.		1, 4, 7, 10, 13 8, 6, 4, 2, 0	Explanation	2	M1 for listing at least 3 terms of both sequences C1 for Yes and explanation from fully correct working that 4 is in both sequences; numbers in A are increasing; numbers in B are decreasing

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Question		Working	Answer	Mark	Notes
17.			5.32	3	M1 $\sin 43^\circ$ used M1 $7.8 \sin 43^\circ$ OR M1 for $7.8 \cos 43^\circ$ (5.704...) and $7.8^2 - 5.704^2$ (28.298) M1 for $\sqrt{28.298}$ OR M1 for correct statement of Sine Rule eg $\frac{7.8}{\sin 90^\circ} = \frac{x}{\sin 43^\circ}$ M1 for correct expression for x e.g. $x = \frac{7.8 \sin 43^\circ}{\sin 90^\circ}$ A1 for awrt 5.32 (5.319587...)
18.	(a)	$21 \times 90 = 1890$ $\sqrt{1890}$	43	2	M1 for $\sqrt{21 \times 90}$ or 1890 seen A1 for an answer in the range 43 – 43.5
	(b)	$50 = \sqrt{21 \times d}$ $2500 = 21d$ $d = 2500 \div 21$	119	3	M1 for $50 = \sqrt{21 \times d}$ oe or 50^2 M1 for $21d = 50^2$ oe A1 for an answer in the range 119 – 119.05

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Question	Working	Answer	Mark	Notes
19.	$\frac{2}{5} = 40\%$ $40\% + 15\% = 55\%$ 27 is 45% or $\frac{9}{20}$ $27 \div 9 \times 8$	24	5	M1 for 40% or $2 \div 5 \times 100$ oe M1 for “40%” + 15% (= 55%) M1 for equating 100% – “55%” with 27 yellow counters M1 for $27 \div “45” \times 40$ oe A1 cao OR M1 for $\frac{15}{100}$ oe M1 for correct attempt to find common denominator to add $\frac{15}{100}$ and $\frac{2}{5}$ (= $\frac{55}{100}$) M1 for equating $1 - “\frac{55}{100}”$ with 27 yellow counters M1 for $27 \div “45” \times 100$ oe A1 cao OR M1 for 0.15 or 0.4 M1 (dep) for ‘0.15 + ‘0.4’ (= 0.55) M1 for equating $1 - ‘0.55’$ with 27 yellow counters M1 for $27 \div 0.45$ A1 cao

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Question	Working	Answer	Mark	Notes
20.	$9 + 6 + 9 + 6 = 30$ $30 \div 0.5$ OR $9 \div 0.5 = 18$ $6 \div 0.5 = 12$ $18 + 12 + 18 + 12$ OR $8 \div 0.5 = 16$ $6 \div 0.5 = 12$ $16 + 12 + 16 + 12 + 4$ OR $9 \times 7 - 6 \times 8 = 15$ $0.5 \times 0.5 = 0.25$ $15 \div 0.25$	60	3	M1 $9 + 6 + 9 + 6$ or $8 + 7 + 8 + 7 (= 30)$ M1 '30' $\div 0.5$ A1 cao OR M1 $9 \div 0.5 (= 18)$ and $6 \div 0.5 (= 12)$ M1 '18' + '12' + '18' + '12' A1 cao OR M1 $8 \div 0.5 (= 16)$ and $6 \div 0.5 (= 12)$ M1 '16' + '12' + '16' + '12' + 4 A1 cao OR M1 for $9 \times 7 - 6 \times 8 (= 15)$ M1 for '15' $\div '0.5^2'$ A1 cao
21.	One bearing line at 260° ($\pm 2^\circ$) or one 9.6 cm line ($\pm 2\text{mm}$) from A	Intersection of 2 lines in boundary of overlay	2	M1 A1 Condone omission of <i>D</i> label Correct position of <i>D</i> within tolerance without any lines scores M1A1.