Paper 1MA1: 3H			
Question	**Working**	**Answer**	**Notes**
1		252	P1 For start to process eg. radius = 12 ÷ 4 (=3) M1 Method to find area of trapezium or semicircle or circle P1 Process to find area of the shaded region A1 251.7 – 252
2 (a)	550 × 3.5601	1958	M1 550 × 3.5601 A1
(b)	210 ÷7 × 2 = 30 × 2 Or 60 ÷2 = 30 and 30 × 7 = 210	Shown	M1 For correct method to convert cost in UK to lira or vice versa, using Asif's approximation C1 Shown with correct calculations
(c)		Correct evaluation	C1 For an evaluation e.g. It is a sensible start to the method because he can do the calculations without a calculator and 3.5 lira to the £ is a good approximation
3 (a)	8, 13, 21,	34	B1 cao
(b)	$a, b, a+b, a+2b, 2a+3b$	Shown	M1 Method to show by adding pairs of successive terms $a+2b, 2a+3b$ shown C1
(c)	$3a + 5b = 29$ $a + b = 7$ $3a + 3b = 21$ $b = 4$, $a = 3$	$a = 3$ $b=4$	P1 Process to set up two equations P1 Process to solve equations A1

Paper 1MA1: 3H			
Question	**Working**	**Answer**	**Notes**
4 (a)	Draws LOBF Finds ht÷base = $\frac{85-20}{0-25} = -2.6$	No + reason	M1 Interpret question eg. draw line of best fit M1 Start to test eg. gradient e.g. $\frac{85-20}{0-25} = -2.6$ C1 Gradient within range ±(2 - 3) and 'no'
(b)		The LOBF would have to be used outside the data	C1 Convincing explanation
5		Have a water meter (from working with correct figures)	P1 Process to find number of litres eg. 180 ÷ 1000 P1 Full process to find cost per day P1 Full process to find total cost of water used per year (accept use of alternative time period for both options) P1 Full process with consistent units for total cost of water A1 Correct decision from correct figures (88.13154 or correct figure for their time period)
6		15, 20, 24	P1 Process to start to find common multiple eg. prime factor decomposition of 6 and 8 or list of at least 3 multiples of all numbers P1 process to find number of packets for at least colour **or** 120 identified A1

Paper 1MA1: 3H			
Question	**Working**	**Answer**	**Notes**
7 (a)		11A	M1 For a cumulative frequency diagram with at least 5 points plotted correctly at the ends of the intervals C1 For correct graph with points joined by curve or straight line segments [SC B1 if the shape of the graph is correct and 5 points of their points are **not** at the ends but consistently within each interval **and** joined.]
(b)		26.5	B1 25 – 28
(c)	80 ÷ 4 × 3 = 60 Draw line parallel to mark axis from CF = 50	36 .5	P1 For process to find number who failed eg 80 ÷ 4 × 3 = 60 P1 Draw line parallel to mark axis from CF = "60" and read off A1 For 35 - 38
8		6.8×10^{-5}	B1

Paper 1MA1: 3H				
Question		**Working**	**Answer**	**Notes**
9	(a)		$(y+6)(y+1)$	M1 for $(y \pm 6)(y \pm 1)$ A1
	(b)	$6x - x > 17 - 4$	2.6	M1 for method to isolate terms in x in an inequality or an equation A1 oe eg. $\frac{13}{5}$
	(c)		−2, −1, 0, 1, 2, 3	M1 for **or** $-2.5 < n \le 3$ **or** −4, −2, 0, 2, 4, 6 **or** −4, −3, −2, −1, 0, 1, 2, 3, 4, 5, 6 A1
10	(a)		$\frac{x+1}{4}$	M1 start to method eg. $y = 4x - 1$ or $x = \frac{y+1}{4}$ A1 oe
	(b)		$\frac{13}{16}$	P1 for start to process eg. $f(4k) = 16k - 1$ or $g(2) = \frac{12+1}{4}$ A1

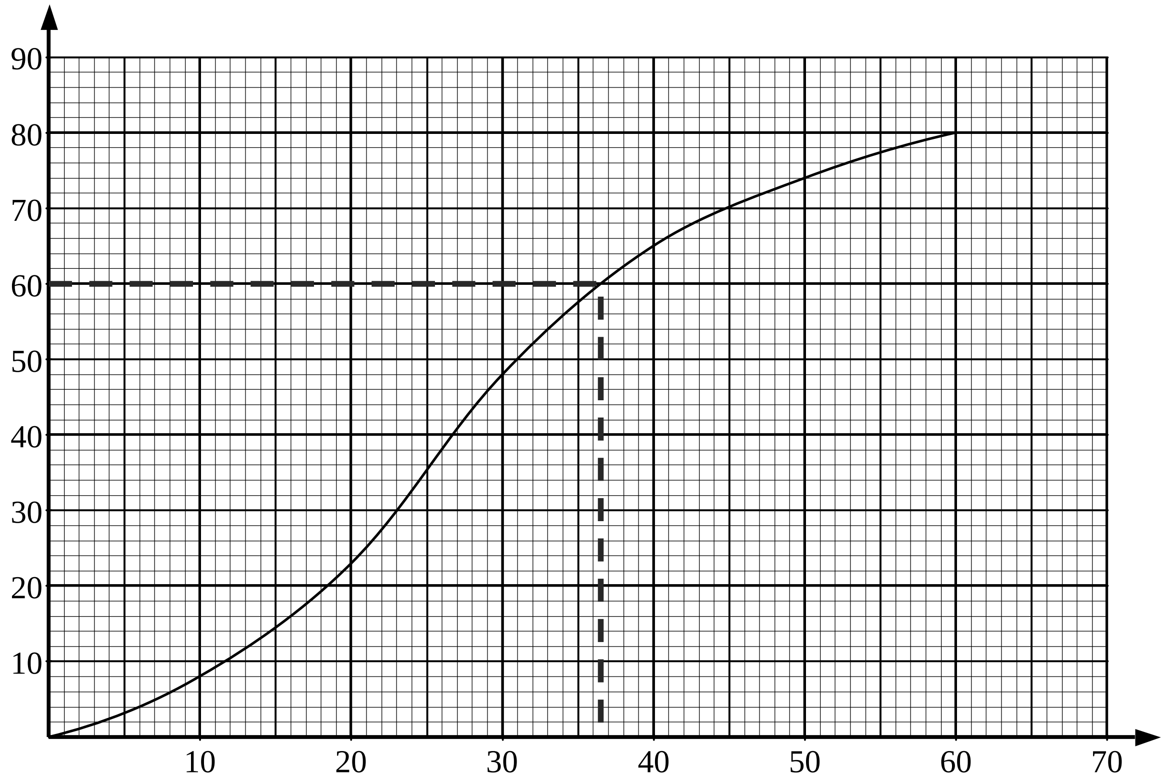
Paper 1MA1: 3H			
Question	**Working**	**Answer**	**Notes**
11	$x = \frac{--5 \pm \sqrt{(-5)^2 - 4\times1\times3}}{2} = \frac{5 \pm \sqrt{13}}{2}$	4.30 or 0.697	M1 Substitute into quadratic formula - allow sign errors M1 Evaluate as far as $\frac{5 \pm \sqrt{13}}{2}$ A1
12 (a)	Draws correct Venn diagram	$\frac{44}{50}$	M1 Begin to interpret given information e.g. 3 overlapping labelled ovals with central region correct M1 Extend interpretation of given information e.g. 3 overlapping labelled ovals with at least 5 regions correct M1 Method to communicate given information e.g. 3 overlapping labelled ovals with all regions correct including outside A1 oe
(b)		$\frac{21}{44}$	P1 For correct process to identify correct regions in Venn diagram and divide by '44' A1
13	$DN = MB$ (given) $\angle NDC = \angle MBC$ (base angles of isosceles triangle) $DC = BC$ (sides of a rhombus are equal) $\therefore\ \Delta DNC \equiv \Delta BMC$ (SAS)	Proof	C1 One correct relevant statement C1 All correct relevant statements C1 Correct conclusion with reasons

Paper 1MA1: 3H				
Question		**Working**	**Answer**	**Notes**
14	(a)	F(x) = $x^3 + 4x - 1$ F(0) = −1, F(1) = 4	Shown	M1 Method to establish at least one root in [0,1]e.g $x^3 + 4x - 1$ (=0) and F(0)(= −1), F(1) (= 4) oe A1 Since there is a sign change there must be at least one root in $0 < x < 1$ (as F is continuous)
	(b)	$4x = 1 - x^3$ Or $\frac{x^3}{4} + x = \frac{1}{4}$	Shown	C1 C1 for at least one correct step and no incorrect ones
	(c)	$x_1 = \frac{1}{4} - \frac{0}{4} = \frac{1}{4}$ $x_2 = \frac{1}{4} - \frac{\left(\frac{1}{4}\right)^3}{4} = \frac{1}{4} - \frac{1}{256}$	0.246(09375) Or $\frac{63}{256}$	B1 $x_1 = \frac{1}{4}$ M1 M1 for $x_2 = \frac{1}{4} - \frac{\left(\frac{1}{4}\right)^3}{4}$ A1 A1 for 0.246(09375) or $\frac{63}{256}$ oe
15	(a)	Number of men possible is 17 Number of women possible is 26 Each man can be paired with 26 different women 17 × 26	442	P1 Process to find number of combinations A1
	(b)		Ben with reason	C1 Convincing reason e.g. correct calculation is 17 × 16 ÷ 2

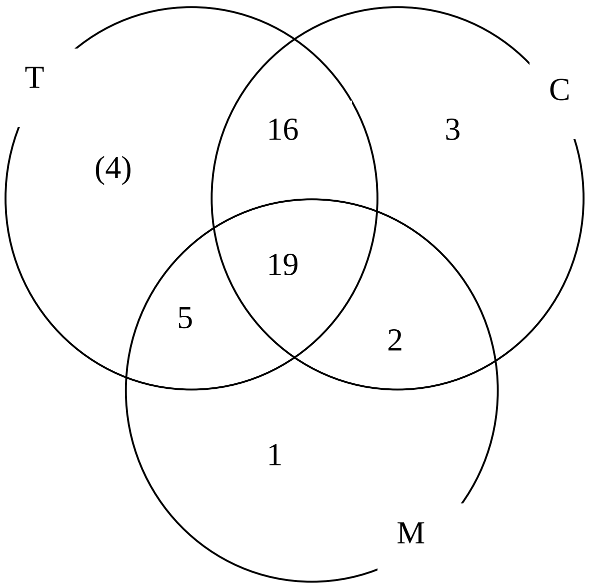
Paper 1MA1: 3H				
Question		**Working**	**Answer**	**Notes**
16		$AC^2 = 20^2 + 20^2 = 800$ $AX^2 = 10^2 + 10^2 = 200$ $\sqrt{200} \times \tan 55 = VX \quad (= 20.19...)$ $VM^2 = \sqrt{"20.19"^2 + 10^2} \quad (= 22.54...)$ $4 \times \frac{1}{2} \times "22.54" \times 20 + 20^2$	1300	Let X be centre of base, M be midpoint of AB P1 process to find AC or AX P1 process to find VX or VA P1 process to find height of sloping face or angle of sloping face. P1 process to find surface area of one triangular face. A1 For 1300 – 1302
17	(a)	1000, 1500, 2250, ...	Correct Argument	M1 Method to find 1st 3 terms C1 Convincing reason e.g. common ratio is 1.5
	(b)	$1000 \times 1.5^9 = k \times 1000 \times 1.5^5$ $k = \frac{1.5^9}{1.5^5}$	5.0625	P1 Process to find the value of k A1
	(c)		Correct sketches	C1 Draws both exponential curves intersecting on y axis and clearly labelled

Paper 1MA1: 3H				
Question	**Working**	**Answer**	**Notes**	
18	$\overrightarrow{OM} = 3\mathbf{a}$ $\overrightarrow{AB} = 6\mathbf{b} - 6\mathbf{a}$ $\overrightarrow{MC} = 3\mathbf{a} + 2(6\mathbf{b} - 6\mathbf{a})$ $= 12\mathbf{b} - 9\mathbf{a}$ $= 3(4\mathbf{b} - 3\mathbf{a})$ $\overrightarrow{MN} = k\mathbf{b} - 3\mathbf{a}$ *MNC* is a straight line so $\overrightarrow{MC}$ is a scalar multiple of $\overrightarrow{MN}$	4	P1 P1 P1 P1 A1	For process to start e.g. $\overrightarrow{OM} = 3\text{a}$ **or** $\overrightarrow{MA} = 3\mathbf{a}$ For process to find $\overrightarrow{AB}$ $(=6\mathbf{b} - 6\mathbf{a})$ For process to find $\overrightarrow{MC}$ $(=3\mathbf{a} + 2(6\mathbf{b} - 6\mathbf{a})$ **and** $\overrightarrow{MN}$ $(= k\mathbf{b} - 3\mathbf{a})$ For correct process to find *k* e,g. $3k\mathbf{b} - 9\mathbf{a} = 12\mathbf{b} - 9\mathbf{a}$

7



13



17