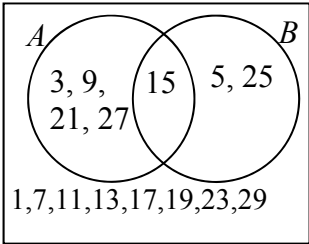


Paper 1MA1: 3H				
Question	Working	Answer	Mark	Notes
1 (a)		Venn Diagram	B1 M1 M1 C1	for labels on diagram for just 15 in the intersection for just 5 and 25 in only set B or just 3, 9, 21 and 27 in only set A or just 1, 7, 11, 13, 17, 19, 23, 29 in $(A \cup B)'$ for all numbers correctly placed in the Venn Diagram Ignore all entries except the region you are marking for each method mark
(b)		$\frac{7}{15}$	P1 A1	ft for $\frac{"7"}{a}$ where $a \geq "7"$ or $\frac{b}{"15"}$ where $b \leq "15"$ ft $\frac{7}{15}$ oe
2		$x = -\frac{2}{3}$ $y = -2$	M1 M1 A1	for a method to eliminate one variable (condone one arithmetic error) (dep) for substituting found value in one of the equations or appropriate method after starting again (condone one arithmetic error) $x = -\frac{2}{3}$ oe and $y = -2$
3 (a)		12	B1	cao
(b)		Explanation	C1	No with statement about not being mutually exclusive events eg a person could be in both categories

Paper 1MA1: 3H				
Question	Working	Answer	Mark	Notes
4		68	P1 P1 P1 P1 A1 OR P1 P1 P1 P1 A1	for a process to find the number of vanilla cakes, eg $420 \times 2 \div 7$ oe (= 120) for a process to find the number of banana cakes, eg 420×0.35 oe (= 147) (dep P1) for a full process to find the number of lemon/chocolate cakes eg $420 - (\text{vanilla cakes}) - (\text{banana cakes})$ (= 153) (dep on previous P1) for a process to find the number of lemon cakes eg "$153 \div 9 \times 4$" oe (= 68) cao OR for writing two proportions in the same format for combining the proportions of vanilla and banana cakes eg $2/7 + 7/20$ (= $89/140$) (dep P1) for a full process to find the proportion or number of lemon/chocolate cakes eg $1 - "89/140"$ (= $51/140$) (dep on previous P1) for a process to find the number of lemon cakes eg "$51/140 \times 420 \div 9 \times 4$" (= 68) cao
5		Shows polygon is a hexagon	M1 M1 A1 C1	for a complete method to find the interior or exterior angle of the dodecagon eg $180 - \frac{360}{12}, \frac{180}{12}(12 - 2)$ oe (= 150), $360 \div 12$ (=30) for a complete method to find the interior angle of polygon P eg at <i>B</i> or <i>C</i>: $360 - "150" - 90$ (= 120) or "$30" + 90$ (= 120) or for a complete method to find the interior or exterior angle of the hexagon eg $180 - \frac{360}{6}, \frac{180}{6}(6 - 2)$ oe (= 120), $360 \div 6$ (= 60) for 30 and 120 or 30 and 60 or 120 and 150 or 60 and 150 complete solution, fully supported by accurate figures

Paper 1MA1: 3H				
Question	Working	Answer	Mark	Notes
6		1.01	P1 P1 P1 A1	fruit syrup 15×1.4 (= 21) or water 280×0.99 (= 277.2) or apple juice 25×1.05 (= 26.25) (dep P1) for complete process to find the total mass e.g. “277.2” + “26.25” + “21” (= 324.45) or a weighted density eg $15 \times 1.4 \div 320$ (= 0.065625) or $280 \times 0.99 \div 320$ (= 0.86625) or $25 \times 1.05 \div 320$ (= 0.08203125) (dep P2) for complete process to find the density eg “324.45” $\div 320$ (=1.01..) or “0.065625” + “0.86625” + “0.08203125” (= 1.0139..) 1.01 to 1.014
7		5.86	M1 A1	for $\sin 23 = \frac{AB}{15}$ NB Allow any alternative equivalent method to form an equation in AB 5.8 to 5.9
8		5.59	M1 M1 M1 A1	For use of $\pi r^2 = 49$, where r is the radius or $r = 3.9(49\dots)$ or diameter = 7.8(9865\dots) For use of Pythagoras to set up an equation in x^2 e.g. $x^2 + x^2 = (d)^2$ or $x^2 = r^2 + r^2$ (dep on M2) Rearrange to $(x^2 =) 2 \times “3.949\dots”^2$ 5.5 to 5.6 For use of trigonometry to set up an equation in x eg $\sin 45 = x \div d$ Rearrange to $(x=)$ “7.898\dots” $\times \sin 45$ oe
9	(a)	180	M1 A1	for evidence of using the LQ (150) and UQ (330) eg $330 - 150$ cao
	(b)	60,180,300,350,650	B2 (B1)	for fully correct box plot for showing a box and at least 3 correctly plotted values
	(c)	Medians 250 and 300	C1	for a correct comparative statement relevant to the question e.g. Yes because the female students have a greater median than the male students

Paper 1MA1: 3H				
Question	Working	Answer	Mark	Notes
10		6 (%)	P1 P1 A1	for y^5 oe or $8029.35 \div 6000$ for a process to find $1+x$ e.g. $\sqrt[5]{(8029.35 \div 6000)}$ or 1.06 or 1.0599.. 5.99 to 6
11		No (supported)	P1 C1	Process to find number of rose trees e.g. $215 \div 17 (=12.647\dots)$ or show number of choices with 12 and 13 eg $17 \times 12 = 204$ and $17 \times 13 = 221$ No with interpretation that 12.6.. is not a whole number or a whole number of plants must be bought or number of plants would have to be between 12 and 13 which is not possible
12		3 : 4 : 11	P1 P1 A1	Makes a start e.g. by using multipliers e.g. $1 + 5 = 6$ and $7 + 11 = 18$ and $6 \times 3 = 18$ or $AB:BD = 3:15$ or $x=3y$ (appropriate x and y shown) or $\frac{1}{6} = \frac{3}{18}$ Complete process to find ratios e.g. $(7 + 11) \div (1 + 5) = 3$ and $1 \times "3" : 7 - ("3" \times 1) : 11$ oe
13		$y \geq -2, y \geq x$ and $y \leq 0.5x + 1$	M1 M1 M1 A1	$y = -2$ indicated; accept any inequality for " $\geq$ " $y = x$ oe indicated; accept any inequality for " $=$ " $y = 0.5x + 1$ oe indicated; accept any inequality for " $=$ " $y \geq -2, y \geq x$ and $y \leq 0.5x + 1$
14 (a)		$\frac{x+4}{2x+3}$	M1 M1 A1	Factorising the denominator $(2x \pm 3)(x \pm 4)$ or $2\left(x \pm 1\frac{1}{2}\right)(x \pm 4)$ Factorising the numerator $(x - 4)(x + 4)$ oe
(b)		$v = \frac{15t}{w+30}$	M1 M1 A1	A correct step towards solution e.g. expanding brackets to get $15t - 30v$ or multiply both sides by v For a method to rearrange the formula to isolate terms in v eg $vw + 30v = 15t$ oe

Paper 1MA1: 3H				
Question	Working	Answer	Mark	Notes
15		2.63	P1 P1 P1 P1 A1	for setting up the expression $\frac{1}{2}(x+3)(2x-1)\sin 45$ (may be seen in an equation) (dep) for expanding the brackets in the expression or for the equation $\frac{1}{2}(x+3)(2x-1)\sin 45 = 6\sqrt{2}$ oe (dep) for the process to set up the equation and rearrange to the form $ax^2 + bx + c = d$ e.g. to $2x^2 + 5x - 27 = 0$ or $24 = 2x^2 + 5x - 3$ (dep) for substitution into the quadratic formula e.g. $\frac{-5 \pm \sqrt{5^2 - 4 \times 2 \times -27}}{4}$ for 2.63(10436...)
16 (a)		$x_1 = -2.64$ $x_2 = -2.57392$ $x_3 = -2.603767255$	M1 M1 A1	for substitution of -2.5 into the equation (to get $x_1 = -2.64$) for substitution of " $x_1 = -2.64$ " and " $x_2 = -2.57392$ " to give x_2 and x_3 for $x_1 = -2.64$ oe, $x_2 = -2.57(392)$ and $x_3 = -2.6(03767255)$ Condone $x_3 = -2.61$ if $x_2 = -2.57$ is used in the substitution
(b)		Statements	C1 C1	Connection between equation and iterative form in (a) e.g. rearrangement Statement e.g. iteration is an estimation of a solution
17 (a)		No (supported)	P1 P1 P1 C1	for 265 or 275 or 274.999... or 107.5 or 112.5 or 112.4999... process to find $\frac{d}{t}$ where $270 < d \leq 275$ and $107.5 \leq t < 110$ oe for process to work in consistent units of time eg $\frac{d}{t} \times 60$ or $t \div 60$ where $265 \leq d \leq 275$ and $107.5 \leq t < 110$ oe or $160 \div 60 (= 2.666...)$ Conclusion supported with correct figure(s) given eg No and 153(.488..) or No and 2.66 to 2.7 and 2.5(581..) from correct working
(b)		Statement	C1	e.g. Less distance in the same time so (max) speed would drop

Paper 1MA1: 3H				
Question	Working	Answer	Mark	Notes
18	Note $DOC=DOA$, $ADO=CDO$	21.6	P1 P1 P1 P1 A1	Recognises that OAD or OCD is 90° or right angle for using trigonometry to set up an equation in DOA or ADO eg $\cos DOA = \frac{5}{9}$ for using inverse trigonometry to find DOA or ADO eg $DOA = \cos^{-1} \frac{5}{9}$ ($= 56.25\dots$) for a complete process to find arc length ABC or AC eg $\frac{360-2\times"56.25.."}{360} \times 2 \times \pi \times 5$ ($=21.598\dots$) or $\frac{2\times"56.25.."}{360} \times 2 \times \pi \times 5$ ($=9.8174\dots$) for answer in the range 21.5 to 21.65
19		$x < -2, x > \frac{1}{2}$	M1 A1 A1	for a first step to solve the quadratic e.g. factorisation: $(2x + 4)(x - \frac{1}{2})$ or $(2x - 1)(x + 2)$ or using the formula $\frac{-3 \pm \sqrt{3^2 - 4 \times 2 \times (-2)}}{2 \times 2}$ for -2 and $\frac{1}{2}$
20 (a) (b)		(0,1) Circle radius 4 Centre (3,0) and (-1,0) and (7,0) labelled	B1 M1 M1 A1	(0,1) For centre (3,0) implied by drawing or label or a circle of radius 4 or intersections on the x -axis at -1 or 7 implied by drawing or labels for 2 of centre (3,0) implied by drawing or label intersections on the x -axis at -1 and 7 implied by drawing or label circle drawn with radius 4 for a fully correct answer