Paper: 1MA1/2H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
12 **Q1**	comparison shown	M1	for starting to manipulate equation, eg $5y = 10x + 15$ **or** $5y = 10x - 4$ **or** $y - 2x + \frac{4}{5} = 0$ **or** $y - 2x = 3$	Ignore constant terms for both marks
		A1	for statement and equation(s) which can be used to show that the gradients of the two lines are the same, eg $5y = 10x + 15$ **and** $5y = 10x - 4$ **and** both have the same x coefficient **OR** $y = 2x - \frac{4}{5}$ **and** both have a gradient of 2	

Paper: 1MA1/2H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
9	Yes with comparisons shown	M1	for starting to manipulate equation eg $y = \dfrac{3}{6}x + \dfrac{7}{6}$ or $y = \dfrac{1}{2}x + \dfrac{7}{6}$ or $3y = \dfrac{3}{2}x - 6 \times 3$ or $6y = 3x - 36$	Ignore constant terms for both marks
Q2		A1	for statement and equation(s) which can be used to show that the gradients of the two lines are the same eg $y = \dfrac{1}{2}x + \dfrac{7}{6}$ **and** both have a gradient of $\dfrac{1}{2}$ or Yes, $6y = 3x - 36$ **and** both have the same x coefficients	

Paper: 1MA1/2H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
3	$y = 3x - 6$	M1	for a correct method to find the gradient of the line, or $m = 3$ **OR** identifies -6 as the intercept in words or in a partial equation **OR** $y - b = m(x - a)$ where $m \neq 3$ and (a, b) is a correct coordinate	Just ringing -6 is insufficient
Q3		M1	for $y = 3x + c$ **or** (L=) $3x - 6$ **or** $y = "3"x - 6$ **OR** $y - y_1 = 3(x - x_1)$ **or** $y - b = "3"(x - a)$ where (a, b) is a correct coordinate	Award of this mark implies the first M1 c must be seen either as a letter or a number
		A1	accept $y = 3x + -6$ oe	

Paper: 1MA1/1H				
Question	Working	Answer	Mark	Notes
6 **Q4**		comparison	M1	starts to manipulate expression e.g. $3y = 9x - 6$ or $3y = 9x - 5$
			A1	gives equation(s) which can be used to show that the gradients of the two lines are the same e.g. $y = 3x - 5/3$

Paper: 1MA1/2H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
16	$y = -\dfrac{3}{4}x - \dfrac{11}{4}$	M1	for identifying gradient of $\dfrac{4}{3}$	Ignore constant term
Q5		M1	for beginning a method to find the gradient of the perpendicular line eg $\dfrac{4}{3} \times m = -1$ **or** identifies gradient of perpendicular line as $-\dfrac{3}{4}$	Can ft providing gradient is clearly stated
		A1	for $y = -\dfrac{3}{4}x - \dfrac{11}{4}$ or any equivalent equation	$4y + 3x = -11$ $y + 5 = -\dfrac{3}{4}(x - 3)$

Paper: 1MA1/1H

Question	Answer	Mark	Mark scheme	Additional guidance
15 **Q6**	$y = -\dfrac{1}{3}x + 8$	M1	for a method for finding the gradient of L_2 eg use of $-\dfrac{1}{m}$ **or** $-\dfrac{1}{3}$	
		M1	(dep) for substitution of (9, 5) into $y = "-\dfrac{1}{3}"x + c$	
		A1	for $y = -\dfrac{1}{3}x + 8$ oe	$y - 5 = -\dfrac{1}{3}(x - 9)$ gets M2A1

Paper: 1MA1/2H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
6 **Q7**	7	P1	process to use gradient eg $y = 3x+$c **or** c $= -6$ **or** $\dfrac{15-9}{d-5}$ **or** $(15 - 9) \div 3$ **or** $(6, 12)$	Condone use of a letter other than d, for d
		P1	(dep) full process to rearrange equation formed to isolate d eg rearrangement of $15 = 3d - 6$ or $3 = \dfrac{15-9}{d-5}$ **or** for $5 + \dfrac{15-9}{3}$	Must show processes to get as far as $d =$ Award P2 for an answer of (7, 15)
		A1	cao	

Paper: 1MA1/1H				
Question	**Working**	**Answer**	**Mark**	**Notes**
19 **Q8**		$y = 2x + 36$	P1 P1 P1 A1	starts process, eg by rearranging to find gradient, eg $y = 6 - \frac{x}{2}$ **or** $\frac{-1}{2}$ **or** positions of B and E complete process to find position of A **or** uses $\frac{-1}{m}$ to find the gradient of **M** complete process to find equation of **M** $y = 2x + 36$ oe

Paper: 1MA1/2H				
Question	**Working**	**Answer**	**Mark**	**Notes**
19 **Q9**		Proof (supported)	M1	for a method to find coordinates of $M(-1, -1)$ or $N(3, 1)$
			M1	for method to find gradient of MN or PR or for method to find column vector for MN or PR or for differences of x coordinates and differences of y coordinates for MN or PR
			A1	for gradients of MN and PR, ie ½ oe or for column vectors of MN and PR, $\overrightarrow{MN} = \binom{4}{2}$ and $\overrightarrow{PR} = \binom{8}{4}$ or for differences of x coordinates and of y coordinates for MN and PR
			C1	for conclusion from reasoning and correct working

Paper: 1MA1/1H

Question	Working	Answer	Mark	Notes
18 **Q10**		$y = -2x + 21$	P1	shows evidence of understanding that *AC* is perpendicular to *DB*, or states the gradient of *DB* as 0.5 oe
			P1	shows a process to find the gradient of a perp. line e.g. use of $-\dfrac{1}{m}$ or states $y = -2x + c$ or states the gradient of AC as -2
			P1	(dep on P2) for sub. of $x = 5$, $y = 11$ into $y = mx + c$ where m is their found gradient for AC.
			A1	oe

Paper: 1MA1/1H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
6 **Q11**	(22, 20)	P1	for process to find width or height of diagram eg $38 - 6 \ (= 32)$ **or** $36 - 7 \ (= 29)$	Figures may be shown on the diagram
		P1	for process to find length of side of square eg "32" $\div 4 \ (= 8)$ **or** process to find half width of diagram eg "32" $\div 2 \ (= 16)$	
		P1	for process to find x coordinate eg $6 + 2 \times$ "8" $(= 22)$ **or** $6 +$ "16" $(= 22)$ **or** $(6 + 38) \div 2 \ (= 22)$	If $(6 + 38) \div 2$ leads to an answer other than 22, award P2 only
		P1	for process to find y coordinate eg $36 - 2 \times$ "8" $(= 20)$ **or** $36 -$ "16" $(= 20)$ **or** $7 +$ "8" $+$ "29" $- 3 \times$ "8" $(= 20)$	
		A1	cao SC: award 4 marks for (20, 22)	Award for P3 for $(22, y)$ or $(x, 20)$ or $x = 22$ or $y = 20$

Paper: 1MA1/1H

Question	Answer	Mark	Mark scheme	Additional guidance
19 **Q12**	$b = \dfrac{2}{3}\,a + 2$	P1	for process to rearrange the equation to give y in terms of x eg $y = \dfrac{7 - 3x}{2}$ **or** $y = -\dfrac{3}{2}x + \left(\dfrac{7}{2}\right)$ **or** $m = -\dfrac{3}{2}$	
		P1	for using their gradient in $mn = -1$	
		P1	for showing a process to find the gradient of PQ eg $\dfrac{b - 4}{a - 3}$ **OR** for substituting $x = 3$ and $y = 4$ in $y = \text{``}\dfrac{2}{3}\text{''}x + c$	
		P1	(dep P3) for forming an equation in a and b eg $\dfrac{b - 4}{a - 3} = \text{``}\dfrac{2}{3}\text{''}$ **or** $b = \text{``}\dfrac{2}{3}\text{''}a + \text{``}2\text{''}$ **OR** correct equation in terms of x and y eg $y = \dfrac{2}{3}x + 2$	$y - 4 = \dfrac{2}{3}(x - 3)$ gets P4
		A1	for $b = \dfrac{2}{3}\,a + 2$ oe	Accept 0.66 or 0.67 oe for 2/3

Paper: 1MA1/3H					
Question		**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
12 (a)		1.5	M1	for method to find the gradient of the line, eg $\frac{12}{8}$	Must see use of scales.
			A1	for 1.5 oe	
(b)		Explanation	C1	Explanation relating to rate of change of volume with time, eg rate at which the container fills or change in number of litres per second or number of litres added per second	Ignore any quantities given. Award the mark for an explanation involving rate.
(c)		Explanation	C1	Explanation relating to volume (amount) of liquid in the container at the start eg number of litres in the container when $t = 0$, amount of liquid in the container to start with	

Q13

Paper: 1MA1/2H				
Question	Answer	Mark	Mark scheme	Additional guidance
12 (a)	−0.09	M1	for suitable method to find gradient, eg 27 ÷ 300	Any readings from the graph must be reasonable. Condone missing negative for M1
		A1	for answer in the range −0.1 to −0.08 oe	
(b) **Q14**		C1	for explanation **Acceptable examples** volume of petrol used each km litres/km Rate of fuel consumption For every 9 litres you can travel 100 km **Not acceptable examples** volume ÷ distance volume of petrol used per distance km/litre as distance increases volume decreases	Can ft explanation linked to incorrect gradient in part (a)

Paper: 1MA1/2H

Question	Answer	Mark	Mark scheme	Additional guidance
11 (a)	(9, 7.5)	M1	for x coordinate = PO (6) $\times \dfrac{3}{2}$ (=9) **or** y coordinate = OQ (3) $\times \dfrac{5}{2}$ (= 7.5) **or** PO (6) $\times \dfrac{5}{2}$ (=15) **or** OQ (3) $\times \dfrac{3}{2}$ (= 4.5)	
		A1	cao	
(b)	$y = -2x + 3$	P1	for process to find the gradient of the line, eg $3 \div 6$ (=0.5) **or** $y = mx + 3$	Could use P and R or Q and R as ft from (a)
Q15		P1	for process to find gradient of perpendicular eg $-1 \div$ [gradient of PQ] (=−2)	
		A1	for $y = -2x + 3$ oe	

Paper: 1MA1/3H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
13	(9, 8)	P1	for setting up an equation for one dimension (width) of the pattern eg $2b - a = 8$ oe **or** $2x + y = 8$ oe	*a* and *b* are the width and length *x* is the difference between the length and width, *y* is the width of the rectangle
		P1	for setting up an equation for the other dimension (height) of the pattern eg $2b + a = 16$ oe **or** $2x + 3y = 16$ oe	
		P1	(dep P2) for a full process to solve for both variables eg $4b = 24$, $b = 6$ and $12 - a = 8$, $a = 4$ **or** $8 = 2y$, $y = 4$ and $8 = 2x + y$, $x = 2$	Both values correct implies this mark
Q16		P1	(dep P3) for a full process to find one of the coordinates of *C* eg $3 + 6 (= 9)$ or $4 + 4 (= 8)$ **or** $3 + 2 + 4 (= 9)$ or $4 + 4 (= 8)$	
		A1	cao	Award 0 marks for a correct answer with no supportive working.

Paper: 1MA1/2H

Question	Answer	Mark	Mark scheme	Additional guidance
18 **Q17**	$\left(\dfrac{-16}{5}, \dfrac{48}{5}\right)$	P1	for a method to find gradient of $\mathbf{L_1}$ eg $\dfrac{6-2}{4-12}$ $(=-½)$ or states $\mathbf{L_2}$ as $y = -3x$	Ignore sketches.
		P1	(dep on P1) for a method to find equation of $\mathbf{L_1}$ eg subs into $y=$ "$-½$"$x+c$ OR states $\mathbf{L_1}$ as $y =$ "$-½$"$x + 8$	
		P1	(dep on P2) complete method to equate both lines eg "$-½$"$x + 8 = -3x$	
		A1	oe	Accept equivalents eg $(-3.2, 9.6)$

Paper: 1MA1/2H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
25 **Q18**	9.75	P1 P1 B1 P1 A1	process to find the gradient of **L** $\left(=-\dfrac{3}{2}\right)$ process to find the gradient of the perpendicular line **M** eg use of $-\dfrac{1}{m}$ or states gradient as $\dfrac{2}{3}$ **or** $y = \dfrac{2}{3}x + c$ (indep) gives y coordinate of $B = 8.5$ oe (dep P2) process to find x coordinate of C ($= 3$) or y coordinate of C ($= 4$) eg the first stage of solving equations or using elimination by substitution, to find a coordinate of C. 9.75 oe	 Could be indicated other ways, eg 8.5 on the y axis of a diagram ft their linear equation for M with L; allow some error in manipulation of these linear equations as long as the overall process is correct. Award 0 marks for a correct answer with no supportive working.

Paper: 1MA1/2H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
5 **Q19**	14.5, 21	P1	for process to work with coordinates, eg $4 - (-3)$ $(= 7)$ **or** $9 - 1$ $(= 8)$	Accept in reverse order eg $-3 - 4$ $(= -7)$ and negative distances throughout
		P1	for process to use ratio, eg "7" ÷ 2 (= 3.5) **or** "8" ÷ 2 (= 4) **or** "7" × 3 (= 21) **or** "8" × 3 (= 24)	This mark is implied by 10.5 or 12 or 17.5 or 20
		P1	for complete process to find x or y coordinate of N, eg "3.5" × 3 + 4 **or** "4" × 3 + 9 **or** "3.5" × 5 –3 **or** "4" × 5 + 1 **OR** to find both the required distances eg "3.5" × 3 (= 10.5) **and** "4" ×3 (= 12) or "21" ÷ 2 (= 10.5) **and** "24" ÷ 2 (= 12) or "3.5" × 5 (= 17.5) **and** "4" × 5 (= 20)	
		A1	oe	