Paper: 1MA1/1H				
Question	**Working**	**Answer**	**Mark**	**Notes**
16 **Q1**		$\frac{7}{3}$	M1 M1 A1	for $y = k\,\sqrt[3]{x}$ oe **or** $\frac{7}{6} = \sqrt[3]{8}\,k$ oe for $k = \dfrac{7}{6 \times \sqrt[3]{8}}$ oe for $\frac{7}{3}$ oe

Paper: 1MA1/2H				
Question	Working	Answer	Mark	Notes
9 **Q2**		65.60	P1	for start in using inverse proportionality, eg $5 \times 4.5 \ (= 22.5)$ or $4.5 = \dfrac{k}{5}$ or $5 \times 4.5 \times 60 \ (= 1350)$ or $\dfrac{5}{3}$ or $\dfrac{3}{5}$
			P1	for process to find number of hours for each cleaner today, eg $\dfrac{22.5}{3} \ (= 7.5)$
			A1	for 65.6(0) (SC B2 for 61.5(0))

Paper: 1MA1/1H

Question	Working	Answer	Mark	Notes
13 (a) **Q3**		$y = \dfrac{9}{x^2}$	M1	begins to work with $y = \dfrac{k}{x^2}$ oe e.g. subs of a pair of numbers into $y = \dfrac{k}{x^2}$ or states $k=9$
			A1	for $y = \dfrac{9}{x^2}$ Accept $y = 9x^{-2}$
(b)		$\dfrac{3}{4}$	M1	ft (dep on previous M1) subs $y = 16$ into proportional formula of the form $y = \dfrac{k}{x^2}$ oe
			A1	oe

Paper: 1MA1/1H

Question	Answer	Mark	Mark scheme	Additional guidance
14 **Q4**	$y = \dfrac{100}{9x^4}$	P1	for setting up a correct proportional relationship, eg $d \, \alpha \, x^2$ **or** $d = kx^2$	Condone the use of 'α' instead of '=' for the four P marks
		P1	for setting up a second proportional relationship, eg $y \, \alpha \, \dfrac{1}{d^2}$ **or** $y = \dfrac{K}{d^2}$	
		P1	(dep P1) for a process to find one of the constants of proportionality eg $24 = k \times 2^2$ ($k = 6$) **or** $4 = K \div 100$ ($K = 400$)	
		P1	full process to find y in terms of x eg $y = \dfrac{"400"}{("6"x^2)^2}$ oe	Both constants must come from a correct process
		A1	$y = \dfrac{100}{9x^4}$ oe	Expression must have been simplified, but could be given other equivalent ways eg $y = 11.111.. \, x^{-4}$

Paper: 1MA1/1H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
20 **Q5**	$h = \dfrac{120}{\sqrt{t}}$	P1	for setting up a proportional relationship between h and p, eg $h \, \alpha \, \dfrac{1}{p}$ **or** $h = \dfrac{k}{p}$ **OR** a proportional relationship between p and t, eg $p \, \alpha \, \sqrt{t}$ **or** $p = K\sqrt{t}$	Condone the use of 'α' instead of '=' for the first two P marks Relationship may be implied by substitution
		P1	for process to substitute at least 2 values, eg $10 = \dfrac{k}{6}$ $(k = 60)$ **or** $6 = K\sqrt{144}$ $(K = 0.5)$	
		P1	for full process leading to $h = \dfrac{"60"}{p}$ oe **and** $p = "0.5"\sqrt{t}$ oe	Both constants must come from a correct process
		A1	$h = \dfrac{120}{\sqrt{t}}$ oe eg $h = \dfrac{120\sqrt{t}}{t}$ **or** $h = \dfrac{60}{0.5\sqrt{t}}$	Formula for h in terms of t Does not need to be in simplest form

Paper: 1MA1/3H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
9 **Q6**	10	P1	for a process to start to solve the problem eg 6 × 9 (= 54) machine days needed or 12 (machine days used in first 3 days) or 42 (machine days needed after first 3 days) or 6 (machine days not used in first 3 days) or 3 + 4 + 5 equivalent to 2 days with 6 machines or has used 48 machine days in first 9 days	eg 3 + 4 + 5 (= 12) eg 6 ×9 – 12 (= 42) eg 3 + 2 + 1 = 6 eg 12 ÷ 6 = 2
		P1	for "42" ÷ 6 (= 7) (more days needed) or 3 days − 2 (equivalent) days (= 1) extra day needed to make up for the days not used	
		A1	cao	

Paper: 1MA1/1H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
18 **Q7**	20	P1	for a statement of proportionality eg $x = k\sqrt{y}$ **or** 1.44 oe	Must be written in the form of an equation with a constant term, accept $x \propto k\sqrt{y}$
		P1	for using $\sqrt{1.44}$ as multiplier eg $(x_2 =) k\sqrt{1.44 y}$ **or** 1.2 oe	
		A1	cao	

Paper: 1MA1/3H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
4 **Q8**	260	P1	conversion to common units of capacity eg 2.2 × 4.54 (= 9.988) or 8 ÷ 4.54 (= 1.76...) **OR** for Company A 2400 ÷ 4.54 (= 528.63...) **OR** 2400 ÷ 8 (= 300) **OR** a rate per minute 8 ÷ [time for Company A] (= 4.8…) oe	Results of calculations may be truncated or rounded. [time for Company A] could be 1 min 40 sec or 1.66… or 1.6 or 1.40 etc as long as it is clear it relates to 1 min 40 sec
		P1	for a complete process to find the time for company A or company B in minutes. eg in litres Company A 2400 ÷ "4.8…" (= 500) or "300" × [1 min 40 sec] (= 500) **or** Company B 2400 ÷ "9.988" (= 240.28...) **OR** eg in gallons Company A "528.63.." ÷ ("1.76..." ÷ [1 min 40 sec]) (= 500) **or** Company B "528.63…" ÷ 2.2 (= 240.28…)	
		P1	for complete processes to find the times for both company A and company B in minutes. Company A eg in litres 2400 ÷ "4.8…" (= 500) or "300" × [1 min 40 sec](= 500) **or** in gallons "528.63.." ÷ ("1.76. .." ÷ [1 min 40 sec]) (= 500) **AND** Company B eg in litres 2400 ÷ "9.988" (= 240.28...) or in gallons "528.63…" ÷ 2.2 (= 240.28…)	
		A1	for an answer in the range 259 to 260	If the answer is given within the range but then rounded incorrectly award full marks.

Paper: 1MA1/3H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
8 (a)	Graph sketched	C1	Sketch	Accept freehand provided intention is clear
Q9 (b)	Graph sketched	C1	Sketch	

Paper: 1MA1/3H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
9 (a)	4	P1 A1	$12 \times 5 \div 15$ cao	
(b) **Q10**	Statement	C1	**Acceptable examples** it could take more time it could take less time it could take more or less time it would take longer if they worked at a slower rate **Not acceptable examples** the time will be less as there are more people if the rate at which the 15 people work changes it would have taken longer it would take less time	

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Paper: 1MA1/3H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
17	$x = \dfrac{1}{2}z^6$	M1	for setting up an equation eg $x = ky^2$ oe **or** $y = cz^3$ oe	Accept use of proportionality sign, eg $x \propto y^2$ or $y \propto z^3$ or $x \propto ky^2$ or $y \propto cz^3$
		M1	for eliminating y eg $x = k(cz^3)^2$ oe OR substitutes values in both equations, eg $32 = ky^2$ and $y = c2^3$	Accept use of proportionality sign, eg $32 \propto ky^2$ and $y \propto c2^3$
Q11		M1	for substituting in 32 and 2 to find the constant, eg $32 = m2^6$ OR combines equations, eg $32 = k\,c^2 2^6$	
		A1	oe	

Paper: 1MA1/1H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
4 (a)	200	M1	for $120 \times 5 \div 3$ oe	
		A1	cao	
(b) **Q12**	statement	C1	Statement that each tap fills at the same rate or that the rate does not change over time Examples **Acceptable responses:** Taps are running at the same speed They (clearly referring to taps) all fill the pool with the same volume of water The amount of water is the same in the same time (again referring to taps) Each tap is doing a fifth of the filling That all taps take equal time to fill the pool All taps produce the same amount of water That the water flow stays at the same rate over the whole time. **Non acceptable responses** It will take more time because there are less taps The less taps used the longer it takes to fill the pool That 1 tap can take up to 24 mins each 3 taps will take longer to fill the pool	Any statement referring to the same amount of water flowing from each tap is acceptable.

Paper: 1MA1/3H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
14 **Q13**	Evidence of solution	M1	for constructing an equation eg $y \propto \frac{1}{x^3}$ or eg $y = \frac{k}{x^3}$ oe	
		M1	for substituting in the values a and 44 into $y = \frac{k}{x^3}$	
		C1	for a complete method to use the equation, the value of k and $x = 2a$ to show $y = 5.5$ eg $(2a)^3 y = 44a^3$ and $y = 44a^3 \div 8a^3 = 5.5$	Must show all steps clearly

Paper: 1MA1/3H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
16	−7.5	M1	for stating a correct relationship, eg $y = \frac{k}{x^2}$ **or** $8 = \frac{k}{2.5^2}$	Accept $y \, \alpha \, \frac{k}{x^2}$ where k may be 1
		A1	for $k = 50$, could be seen in an equation	
Q14		A1	−7.5 oe	

Paper: 1MA1/1H				
Question	Answer	Mark	Mark scheme	Additional guidance
13 **Q15**	$t = 20$ $p = 4, 50$	M1	for method to find a missing value of p, eg $\dfrac{100}{25}$ oe (= 4) or $\dfrac{100}{2}$ oe (= 50) **or** for $p = \dfrac{100}{t}$	Marks for 4 or 50 can only be awarded if in correct cell of table or unambiguous in working
		M1	for method to find the missing value of t, eg $100 \div \dfrac{5}{1}$ (= 20) **or** for finding both missing values of p	Mark for 20 can only be awarded if in correct cell of table or unambiguous in working
		A1	cao	

Paper: 1MA1/1H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
17 **Q16**	$y = \dfrac{40}{\sqrt{x^3}}$	P1	for setting up an equation with a constant term, eg $y = k\sqrt{t}$ **or** $t = \dfrac{K}{x^3}$	Condone the use of 'α' instead of '=' for the first two P marks Equation can be implied by correct substitution
		P1	for a process to substitute values in one equation, eg $15 = k\sqrt{9}$ or $k = 5$ **or** $8 = \dfrac{K}{2^3}$ or $K = 64$	
		P1	(dep P2) for combining the two equations ft their values of k and K, eg $y = 5\sqrt{\dfrac{64}{x^3}}$ **OR** for $y = 5\sqrt{t}$ **and** $t = \dfrac{64}{x^3}$	
		A1	oe	Formula must include 40 Accept other forms for the power of x but must be a single term in x

Paper: 1MA1/2H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
11 **Q17**	Shown	M1	for 6×14.5 (= 87) **or** 13×7 (= 91) **or** $13 \div 6$ (= 2.16(666…))	May work in hours or other units of time
		M1	for "87" ÷ 7 (= 12.428...) **or** "87" ÷ 13 (= 6.692…) **or** 6×14.5 (= 87) **and** 13×7 (= 91) **or** 14.5 ÷ "2.16" (= 6.692...)	Accept figure rounded or truncated to 1dp
		C1	(dep M2) for 12.(428…) (workers) **or** 6.69(2…) (days) **or** 87 **and** 91	Figures must be correct and supported by working. Accept value in range 6.69 to 6.72 for number of days