

Question			Answer	Mark	Part Marks and Guidance	
1			Correct working leading to correct reason e.g. yes and 21.[3..] and 24 or 1280 and 1440 or [80 and] 90 or 2.6[.] or 2.7 [and 3] or 7.[1..] and 8	5	M1 for unit calculation e.g. $48 \div 3$ M1 for scale factor e.g. 80×16 <i>possibly in one stage</i> M1 for first conversion e.g. $1280 \div 60$ M1 for second conversion e.g. 3×8 <i>possibly in one stage</i> A1 dep on M3 or M4 for 'Yes' and two correct comparative figures	Accept any correct method e.g. M1 for $48 \div 3$ soi by 16 M1 for $80 \times$ <i>their</i> 16 soi by 1280 M1 for <i>their</i> $1280 \div 60$ soi by 21.33... M1 for 3×8 soi by 24 A1 for yes and $21.33... < 24$ Allow 21 hours 20 minutes
2			1.5×10^3	4	B3 for 1500 or $1.50[0] \times 10^3$ or $1.48[9..] \times 10^3$ or 1.49×10^3 or B2 for 1489.1... or M1 for $\frac{5.8 \times 10^6}{\sqrt{4.1 \times 10^8 \times 3.7 \times 10^{-2}}}$ and M1 for writing <i>their</i> answer correct to 2s.f. and in standard form	implied by 3894.8... or 3894.9 need to see where <i>their</i> answer comes from e.g. longer figure or a simple fraction
3			11 45 [am]	4	SC3 for 11 45 pm OR B2 for LCM as 225 and M1 for <i>their</i> LCM correctly converted to hours and minutes OR M1 for $25 = 5 \times 5$ and $45 = 3 \times 3 \times 5$ and M1 for [0] 8 00 plus <i>their</i> LCM OR B1 for listing [0] 8:25, [0]8:50, [0]9:15... or 25, 50, 75.. and B1 for listing [0]8:45, [0]9:30, 10:15... or 45, 90, 135..	condone 11 45 h[ours] or 11 h[ours] 45 m[ins] as answer implied by 3[h] 45 [m] including 1[h] 15[m] for 75 including 1[h] 30[m] and 2[h] 15 [m]

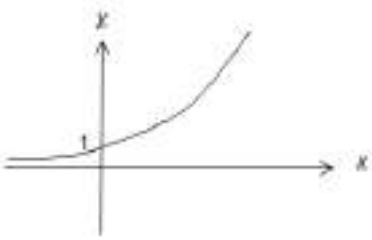
Question			Answer	Mark	Part Marks and Guidance	
4	(a)		50×30 $\frac{50 \times 30}{1+2+3}$ [$\times 1, 2$ or 3] $2 \times 250 = 500$	1 1 1	Accept any correct method e.g. M1 for $\frac{2}{1+2+3} = \frac{2}{6}$ M1 for $\frac{2}{6} \times 50$ or $50/3$ M1 for $\frac{50}{3} \times 30 = 500$ Alternative method M1 for $30 \div 6 = 5$ M1 for <i>their</i> $(30 \div 6) \times 2$ M1 for $50 \times 10 = 500$	watch for wrong method $50 \times 20 = 1000$. $1000 \div 2 = 500$ Mark to candidates advantage
	(b)		32	5	M1 for $\frac{250}{25}$ or $\frac{500}{20}$ or $\frac{750}{15}$ M1 for <i>their</i> $10 \times 5.5[0]$ or <i>their</i> $25 \times 2[.00]$ or <i>their</i> $50 \times 3.9[0]$ M1 for <i>their</i> $10 \times 5.5[0] + \text{their } 25 \times 2[.00] + \text{their } 50 \times 3.9[0]$ M1 for $\frac{396}{\text{their } 300}$ or $\frac{396 - \text{their } 300}{\text{their } 300}$ Alternative method M1 for $\frac{\frac{30}{6} \times 1}{25}$ or $\frac{\frac{30}{6} \times 2}{20}$ or $\frac{\frac{30}{6} \times 3}{15}$ or $\frac{396}{50}$ M1 for $5.5[0] \times \text{their } [0].2$ or $2[.00] \times \text{their } [0].5$ or $3.9[0] \times \text{their } 1$ M1 for <i>their</i> $(5.5[0] \times [0].2) + \text{their } (2[.00] \times [0].5) + \text{their } (3.9[0] \times 1)$ M1 for $\frac{7.92}{\text{their } 6}$ or $\frac{7.92 - \text{their } 6}{\text{their } 6}$	M1 may be implied by 10 or 25 (<i>no. of bags/part bags of cement, sand, stone</i>) M2 may be implied by 55 and 195 (<i>cost of cement, sand, stone</i>) M3 may be implied by 300 or 6 nfw (<i>total production cost</i>) M1 may be implied by 0.2, 0.5 or 1 or 7.92 (<i>no. of bags/part bags of cement, sand, stone or price of 1 bag</i>) M2 may be implied by 1.1[0], 1[.00] or 3.9[0] (<i>cost of cement, sand, stone for 1 bag</i>) M3 may be implied by 6 nfw (<i>total production cost of 1 bag</i>)

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5			$4x^2 - 11xy - 3y^2$ final answer	3	M2 for three correct terms from $4x^2 - 12xy + [1]xy - 3y^2$ oe or M1 for two correct terms in the expansion above	M1 implied by two correct terms in answer
6			$\frac{21}{50}$	3	M1 for two ratios with a common number of sherberts e.g. 14 : 21 or 21 : 15 or 50 and M1 for $\frac{\text{their } 21}{\text{their } (14+21+15)}$ only after valid attempt to create a triple ratio eg 0 for $\frac{3+7}{2+3+7+5}$ etc allow any correct method	Alternative : M1 for $7 \div 3$ implied by 2.3[3...] oe or better and M1 for $5 \div 2.3[3...]$ oe implied by 2.1428..... (exact = $\frac{15}{7}$) or $2 \times 2.3[3..]$ oe and e.g. 2 : 3 : <i>their</i> $\frac{15}{7}$ (= 14 : 21 : 15) or <i>their</i> $\frac{14}{3}$: 7 : 5
7	(a)		2 points plotted correctly	1		tolerance $\pm \frac{1}{2}$ small square
	(b)		positive	1		Ignore embellishments
	(c)	(i)	acceptable ruled line	1		see overlay, it must be at least from $x = 10$ to $x = 45$ and between (10,4) to (10,12) and (45,40) to (45,50) if more than 1 line, both must be in tolerance, ignore horizontal and vertical lines.
		(ii)	35 to 44	1		for answers out of tolerance FT <i>their</i> ruled line with positive gradient with tolerance $\pm \frac{1}{2}$ small square
	(d)		42 or 41.7 or 41.66... or 41.67	4	B1 for 5 M1 for $\frac{\text{their } 5}{12}$ M1 for $(\text{their } \frac{5}{12}) \times 100$ If 0 scored SC2 for answer of 30 from $\frac{3}{10}$ or 36[.36...] or 36.4 from $\frac{4}{11}$	<i>their</i> 5 must be less than 12 implied by [0].4166...

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8			[adult =] 12[.00] [child =] 4.5[0]	5	B1 for $5a + 4c = 78$ B1 for $3a + 6c = 63$ M1 for multiplying/dividing both equations to get the coefficient of one variable equal (allow one error) M1 for correctly adding or subtracting both equations to eliminate one variable (allow one error)	one error in total
9	(a)		6	3	B1 for $3(k - 4) = k$ oe M1 for solving <i>their</i> equation to get k on one side and numbers on the other e.g. $3k - k = 12$	also $\frac{k}{3} + 4 = k$ condone use of other letters
	(b)		$\frac{y}{3} + 4$ oe	2	M1 for $\div 3$ and $+ 4$ e.g. $\frac{y+4}{3}$	
	(c)		16	2	B1 for output of first function as 36 or $3(3(n - 4) - 4) = 96$ or better	e.g. $9n - 48 = 96$
10	(a)		165 000	1		
	(b)		3	1		
	(c)		$165\,000 \times 1.03^7$ 202 929.1878 truncated or rounded to at least 3sf	1 1		

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11	(a)		Accept any correct reason e.g. No as lengths are unknown or lengths may be double each one or triangles are similar	1		See exemplars in appendix
	(b)		First correct reason	1	Reasons are Angle [I]G[H] = angle [L]J[K]	Reasons can be given in any order
			Second correct reason	1	GH = JK	Allow same angle, (36), but lines must be identified
			Third correct reason and SAS	1	GI = JL	
12	(a)		24	1		condone 24 000
	(b)		14 26 36 50 60	2	B1 for complete table with three correct	
	(c)		28.5	5	B1FT for frequencies 14, 12, 10, 14, 10 with one error (allow FT table in (b)). B1 for 5, 15, 25, 40, 65 (allow one error) M1 for $\sum(\text{their midpoint} \times \text{their frequency})$ M1 for <i>their</i> $1710 \div 60$	implied by $70 + 180 + 250 + 560 + 650$ or 1710 <i>their</i> midpoint must be within the group range
	(d)		Acceptable answer e.g. for the mean the figures used are approximate	1		See exemplars in appendix

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13	(a)		241.[1...]	3	M2 for $90 \div 72^3 [\times 100^3]$ or B1 for 72^3 or 373 248 or 100^3 or 1 000 000	implied by e.g. 90 000 000
	(b)		392	3	M2 for $8 \times 7 \times 7$ or M1 for $8 \times 7 \times 8$ or 8, 7, 7 clearly identified (e.g. summed) if 0 scored award SC2 for $8 \times 7 \times 6$ or SC1 for $8 \times 8 \times 8$, $6 \times 7 \times 6$	e.g. 448 as answer implied by 336 implied by 512 or 252
14			25	5	M1 for $m_1 = \frac{16}{-12}$ oe M1 for $m_2 = \frac{-1}{\text{their } m_1}$ or $\frac{12}{16}$ oe M1 for $y = (\text{their } \frac{12}{16})x + p$ M1 for substituting (-12,16) into <i>their</i> equation accept any correct method	gradient of radius gradient of tangent
15	(a)		6.0[1...] or 6 nfw	3	M2 for $DF^2 = 10^2 + 12^2 - 2 \times 10 \times 12 \cos 30$ oe and allow one error or M1 for $\cos 30 = \frac{10^2 + 12^2 - DF^2}{2 \times 10 \times 12}$, condone one error	nfw i.e. not $12 \times \sin 30$ M2 implied by $DF^2 = 36.15$ to 36.16 if they draw a perpendicular from F to P on DG award M1 for correct method to find both FP = 5 and PG = 8.6[6...] or 8.67 or 8.7 M1 for correct use of Pythagoras' on triangle FPD
	(b)		57.3[...] or 57 nfw	4	M2 for $[\sin B =] \frac{12.4 \times \sin 63}{12.8}$ or M1 for $\frac{\sin B}{12.4} = \frac{\sin 63}{12.8}$ oe and M1 for $180 - 63 - \text{their } 59.67$	implied by [0].863... or 59.67 to 59.7

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16			$\frac{4(x-1)}{x^2-1}$ oe $x + 9 + 4x - 4$ or $5x + 5$ numerator = $5(x + 1)$ denominator = $(x + 1)(x - 1)$	M1 M1 A1 A1	also allow method with denominator $(x^2 - 1)(x + 1)$ e.g. M1 for $\frac{(x+9)(x+1)}{(x^2-1)(x+1)}$ or $\frac{4(x^2-1)}{(x^2-1)(x+1)}$ M1 for $x^2 + 9x + x + 9 + 4x^2 - 4$ or better If 0 scored SC1 for $x^2 - 1 = (x + 1)(x - 1)$	
17				2	B1 for either an acceptable curve and no/incorrect y intercept marked or any curve with 1 marked at the y intercept	
18	(a)		330	2	M1 for $\frac{1}{2} \times 10 \times 6 \times 11$	
	(b)		$\tan [\dots] = \frac{6}{10}$ oe 30.9[...]	1 1	accept any correct method, equivalents include $\tan^{-1}(0.6)$	
	(c)		$\sqrt{257}$ cao	4	M3 for $\sqrt{11^2 + 10^2 + 6^2}$ or better or M2 for $11^2 + 10^2 + 6^2$ or M1 for $11^2 + 10^2$ or $10^2 + 6^2$ or [FD =] $\frac{10}{\cos 31}$ or $\frac{6}{\sin 31}$	implied by 16.0[3...] implied by 257 implied by [FD =] $\sqrt{136}$ or 11.6 to 11.7 or [AC =] $\sqrt{221}$ or 14.8 to 14.9

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19			1.0 to 1.4 dep. on a tangent drawn	4	B3 for an answer within the given range with a slightly inaccurate tangent, i.e. touches curve in range $t = 4.5$ to 5.5 but not at $t = 5$ or an answer of 1.3 using a symmetric chord about $t = 5$ e.g. from (4, 2) to (6, 4.6). OR B2 for an answer from using a symmetric chord about $t = 5$, e.g. from (4, 2) to (6, 4.6), with at most one error OR M1 for an attempt to draw a tangent touching curve at $t = 5$ and M2 for <i>their</i> distance $\div$ <i>their</i> time e.g. $(7.4 - 1.2) \div (8 - 3)$ or M1 for an attempt at <i>their</i> distance $\div$ <i>their</i> time with one error or a correct attempt to find the gradient of <i>their</i> line which is not a tangent e.g. line from (0, 0) to (5, 3) which gives the average speed of $\frac{3}{5}$ or 0.6	Note: $5 \div 3 = 1.66\dots$ scores 0