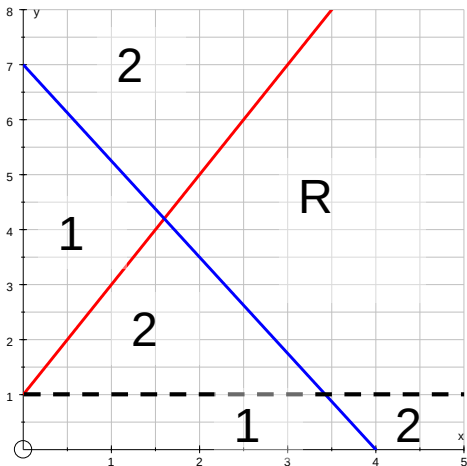


Question			Answer	Marks	Part marks and guidance	
1	(a)		2	2	B1 for $\left[\sqrt[3]{64} = \right] 4$ or for $\frac{1}{2}$ oe	Accept $4^3 = 64$ for B1
	(b)		4.68×10^5 final answer	3	B2 for 468 000 or answer 4.7×10^5 or B1 for 430 000 or 43×10^4 or 38 000 or 0.38×10^5 seen M1 for figs 468 oe in final answer	
2			9 with correct rounded values shown nfww	3	M1 for two of 600, 0.3 and 20 M1 for a first correct calculation with one pair of <i>their</i> rounded values or M1 FT for second correct calculation	Condone e.g. 0.300 M1 can be implied by 180, 30, 0.015, 9.09, 9.15
3	(a)		36 and 45	1		
3	(b)		Even and prime are not mutually exclusive oe $\frac{8}{12}$ oe	1 1		e.g. 2 is both prime and even 2 is counted twice One number is prime and even Do not accept there are only 2 prime numbers
4			4 g/cm^3 or g cm^{-3}	2 1	M1 for figs 5 $\div$ figs 125	If change of units then allow consistent units with conversion e.g. for 3 marks 0.004 kg/ cm^3

Question			Answer	Marks	Part marks and guidance	
5	(a)		12	3	M2 for $\frac{57.8 - 54.2}{0.3}$ oe or M1 for $57.8 - 54.2$ or 3.6 seen or for repeated subtraction of 0.3 from 57.8 or for repeated addition of 0.3 to 54.2	Minimum of 2 repeats Minimum of 2 repeats
5	(b)		Answer would be bigger oe	1		e.g. It would take more days It will take longer
6			No and she can only get 12[.5] strips nfw or No and $31\frac{1}{5}$ oe [> 30] oe nfw	4	B3 for 12.5 or $\frac{25}{2}$ oe or $31\frac{1}{5}$ oe or B2 for $28\frac{4}{5}$ oe seen or $1\frac{1}{5}$ oe or for $30 \times \frac{5}{12}$ oe or $\frac{150}{5} \div \frac{12}{5}$ oe or M1 for $30 \div 2\frac{2}{5}$ oe or $13 \times 2\frac{2}{5}$ oe	Amount of material used for 12 strips Amount left over from 12 strips For M1 accept attempt for repeated addition of $2\frac{2}{5}$ oe to make 30 (at least 3 repeats) condone 1 error in the addition
7			2000	3	M2 for $2400 \div \frac{100 + 20}{100}$ oe or M1 for $1.2(0)$ oe seen or for 2400 associated with 120[%]	

Question			Answer	Marks	Part marks and guidance	
8	(a)		Correctly completes graph	2	B1 for 2 or 3 correct plots or for 4 plots at correct height	Use overlay, mark in 60% zoom For 2 marks, condone points not joined
8	(b)		He is correct oe with 60 and 150 shown [= 2 : 5]	2	M1 for 13 + 20 + 27 oe or 45 + 47 + 58 oe	
8	(c)		Correct overall comment	1	i.e. increasing oe	isw extra statements
			Correct seasonal comment	1	e.g. [Sales were] weakest in 1st quarter [Sales were] strongest in 4 th quarter	See AG isw extra statements
8	(d)		The trend in his sales will continue [at a similar rate] oe	1		Accept any correct relevant comment referring to general trend or 4 th quarter trend isw extra statements See AG
9			$y = [\pm]\sqrt{x-7}$	2	M1 for $x-7 = y^2$ or for answer $[\pm]\sqrt{x-7}$ or for correct step to answer after incorrect first step shown	e.g. answer $y = \sqrt{x+7}$ after 1 st step is $y^2 = x+7$
10	(a)	(i)	Triangle drawn at (-3, -2), (-5, -2) (-3, -6)	2	M1 for rotation 180° but wrong centre or 3 correct points not joined	Use overlay condone good freehand, mark intention If triangle B transformed then treat as misread in both parts (i) and (ii)
10	(a)	(ii)	Triangle drawn at (7, -5), (5, -5) (5, -1)	2	M1 for translation by $\begin{pmatrix} 2 \\ k \end{pmatrix}$ or $\begin{pmatrix} k \\ -7 \end{pmatrix}$ or 3 correct points not joined	Use overlay condone good freehand, mark intention

Question		Answer	Marks	Part marks and guidance	
13	(a)	AC = 40sin30 20 and evidence that sin 30 = 0.5	M2 A1	M1 for $\frac{AC}{40} = \sin 30$ oe If 0 scored, B1 for sin 30 = 0.5 oe	
13	(b)	$20(\sqrt{3} - 1)$	5	B4 for $20\sqrt{3} - 20$ or $\sqrt{1200} - 20$ or B3 for $\sqrt{1200}$ or $\frac{40\sqrt{3}}{2}$ or M2 for 40cos30 oe or M1 for $\cos 30 = \frac{AB}{40}$ oe	Other methods are possible e.g. Pythag e.g. M2 for $[AB =]\sqrt{40^2 - 20^2}$ e.g. M1 for $AB^2 + 20^2 = 40^2$
14			5	B2 for $y = 1$ broken line or B1 $y = 1$ solid line AND B1 for R correct side of $7x + 4y = 28$ B1 for R correct side of $y = 2x + 1$ B1 for R correct side of $y = 1$	Line long enough to define region If other lines, treat as choice unless labelled See marks on diagram for the final B3 marks (assumes $y = 1$ is drawn) Condone R not labelled if shading (in or out) is clear
15	(a)	22	2	B1 for [UQ=] 74 or [LQ=] 52	e.g. answer 74 alone scores B0
15	(b)	48 to 49	3	B2 for 16 seen or M1 for $80 \div (4 + 1)$	For B2 accept 16/80
16	(a)	45	1		

Question			Answer	Marks	Part marks and guidance	
16	(b)		$5 \times \sqrt{3}^{(n-1)}$ oe	3	M2 for expression of correct form with two correct elements e.g. $5 \times (\sqrt{3})^n$ or M1 for expression of correct form with one correct element e.g. $3 \times (\sqrt{3})^n$	
17			3 : 2 nfww	4	B3 for 15 [shaded] and 10 [unshaded] or M2 for $5^2 - 4^2$ oe or $4^2 - 1^{[2]}$ oe or M1 for 4^2 or 5^2 oe seen	
18	(a)	(i)	$(x + 2)^2$ final answer – 20 final answer	1 2	FT <i>their</i> $(x + 2)^2$ final answer M1 for after $(x + a)^2$ shows –16 – <i>their</i> a^2	

Question			Answer	Marks	Part marks and guidance	
18	(a)	(ii)	$-2 \pm 2\sqrt{5}$	4	B3FT <i>their</i> (a)(i) for $-2 + \sqrt{20}$ or $-2 - \sqrt{20}$ or better or M2 for $x + 2 = (\pm)\sqrt{20}$ FT <i>their</i> (a)(i) or M1 for $(x + 2)^2 = 20$ FT <i>their</i> (a)(i) OR <u>Alternative method</u> B3 for $\frac{-4 \pm 4\sqrt{5}}{2}$ or M2 for $\frac{-4 \pm \sqrt{80}}{2}$ oe or M1 for $\frac{-4 \pm \sqrt{4^2 - 4 \times 1 \times -16}}{2 \times 1}$ oe	FT dep on expression in form $(x + a)^2 - b$ in part (a)(i) Condone 1 slip e.g. 1 sign error, 1^2 for 1, short fraction line, short root
18	(b)		U shaped parabola with turning point in 3rd quadrant indicated at $(-2, -20)$ soi	1 2	B1FT for turning point at $(k, -20)$ or $(-2, k)$ soi FT <i>their</i> (a)(i)	Be generous for the U shape condone broken line Values must be shown but could be marked on axes. Mark intention Accept turning point = $(-2, -20)$ written in working provided no contradiction on sketch If point $(-2, -20)$ only plotted on graph in 3rd quadrant and no sketch then award 2 marks
19	(a)		66	2	M1 for $180 - 2 \times 57$ or B1 for angle $OCD = 57$	Could be on diagram

Question			Answer	Marks	Part marks and guidance	
19	(b)		49	3	M2 for angle ADO = $180 - 82 - 57$ oe or M1 for angle ADC = $180 - 82$ oe or M1 for angle ODF = 90 soi	41 angles could be on diagram 98 e.g. Angle CDF = 33
20	(a)		$[(2x + 1)(3x + 2) =] 6x^2 + 3x + 4x + 2$ or better $[x(3x + 5) =] 3x^2 + 5x$ $9x^2 + 12x + 4$ $(3x + 2)^2$ which is a perfect square	M2 M1 M1 A1 A1	B1 for 3 out of 4 terms correct FT <i>their</i> expansions dep on 3 term quadratic	$6x^2 + 7x + 2$, $7x$ counts as 2 terms For B1 accept terms on a grid Condone if expression ' $= 0$ ' For A1 accept $(3x + 2)(3x + 2)$
20	(b)		Cannot square root a negative value oe or for $9x^2 + 12x + 4 [= 0]$ and $b^2 - 4ac < 0$ with a, b, c substituted or values shown oe	1		