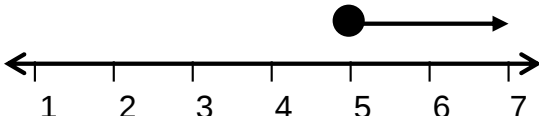


Question	Answer	Marks	Part marks and guidance	
1	$x \geq 5$ AND 	4	B2 for $x \geq 5$ as final answer or M1 for $3x \geq 10 + 5$ or better AND B2FT for $x \geq 5$, or <i>their</i> inequality, correctly shown or B1FT for $x \geq 5$, or <i>their</i> inequality, shown with a correct circle and wrong arrow or wrong circle and correct arrow	Solution to inequality Allow M1 for this expression with other inequality symbols or equals sign or $[x \geq] 5$ as solution (can be implied by mark/circle on the diagram) or trials leading to selection of 5 or final correct trial using 5 Displaying the solution Display must show an inequality that fits on the number line for FT Mark to candidate's advantage either $x \geq 5$ or <i>their</i> inequality Accept an arrow of any length or a line reaching 7 If no solution to inequality seen: Filled circle at 5 arrow to right M1B2 Empty circle at 5 arrow to right M1B1 Filled circle at 5 arrow to left M1B1 Empty circle at 5 arrow to left M1B0 Mark at 5 no line or arrow M1B0 Circle and/or arrow at other than 5 M0B0

Question			Answer	Marks	Part marks and guidance	
2			31 218	5	M4 for $54868 - \frac{54868}{2.32}$ oe or M3 for $\frac{54868}{2.32}$ soi by 23650 or 236.5 or M2 for 2.32 or 232[%] soi or M1 for 1.32 or 132[%] soi If M1 only scored then also allow an SC1 for $\frac{54868}{1.32}$ soi by 41566 to 41567	May be seen as $54868 \times \frac{132}{232}$ or 236.5×132 Examples of implied: 2.32 implied by $[A =] 0.32B + 2B$ oe but not by $32[\%] \times B + 2B$ oe 1.32 implied by $0.32 + 1$ but not by $32[\%] + 1$ nor $0.32 + 100[\%]$
3			$\frac{1}{27}$	3	M2 for $\frac{2}{6} \times \frac{2}{6} \times \frac{2}{6}$ soi by $\frac{8}{216}$ oe or 0.037[...] or 3.7[...]% or B1 for $\frac{2}{6}$ oe If 0 scored then SC1 for $(their \left(\frac{2}{6}\right))^3$ oe	$0 < their \left(\frac{2}{6}\right) < 1$

Question			Answer	Marks	Part marks and guidance	
4			80 nfwv	5	B3 for height [of B =] 10 OR M2 for $3x^2 = \text{their } (12 \times 25)$ or better or M1 for $3x \times x$ oe or 300 seen A1 for $x = 10$ AND M1 for $(2 \times \text{their } 10) + (2 \times 3 \times \text{their } 10)$ oe or for $2a + 2b$ where $ab = 300$ but not with 25 and 12	May be seen on diagram May be implied by arithmetic processing e.g. $\sqrt{\frac{\text{their } (12 \times 25)}{3}}$ or at least two trials of $3 \times \text{number} \times \text{number}$ intending 300 Allow <i>their</i> 10 if clearly intended as height e.g. "$h =$" or marked on diagram e.g. M1M1 for $2 \times 36 + 2 \times 8.3[3\dots]$ after 300 seen

Question	Answer	Marks	Part marks and guidance	
5	3.2 nfwv	6	M3 for 1500×1.03^5 or M2 for 1500×1.03^k where k is 2, 3 or 4 or M1 for 1.03 soi perhaps by 1545 AND M2 for $\frac{\text{their } 1738.91 - 1500}{5 \times 1500} [\times 100]$ oe or M1 for $(\text{their } 1738.91 - 1500) \div 5$ or for $(\text{their } 1738.91 - 1500) \div 1500$ <u>Alternative (not using a base amount)</u> M5 for $[r =] (1.03^5 - 1) \div 5$ or M4 for $1.03^5 - 1$ or M3 for 1.03^5 or M2 for 1.03^k (where k is 2, 3 or 4) or M1 for 1.03	
				Condone 3.2% as final answer soi by 1738 to 1739 soi by [2 yr =] 1591[.35], [3 yr =] 1639[.09..] or [4 yr =] 1688.[26...] <i>their</i> 1738.91 must come from a valid attempt to find compound interest for at least 2 years M2 soi by 0.0317 to 0.032 or soi by 3.17 to 3.19 M1 soi by 47.6[0] to 47.8[0] or soi by [0].1586 to 0.1594

Question			Answer	Marks	Part marks and guidance
6			43.75 or 43.8	4	M3 for $\frac{7}{16} [\times 100]$ OR M1 for 16 correct combinations shown or for 4×4 [combinations] M1 for AA, AC, AG, AS, BA, EA, PA only or 7 [combinations involving Alice] identified <u>Alternative method</u> M3 for $\frac{7}{16} [\times 100]$ or M2 for $1 - \frac{3}{4} \times \frac{3}{4}$ or $\frac{1}{4} + \frac{3}{4} \times \frac{1}{4}$ or $\frac{1}{4} \times \frac{1}{4} + \frac{1}{4} \times \frac{3}{4} + \frac{3}{4} \times \frac{1}{4}$ or M1 for $\frac{3}{4} \times \frac{3}{4}$ or $\frac{3}{4} \times \frac{1}{4}$ or $\frac{1}{4} \times \frac{1}{4}$

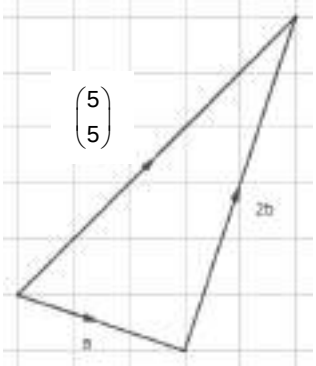
Accept 44 after correct method seen

Implied by 16 or a denominator of 16

Allow [0].75 and [0].25 throughout

soi by 9/16, 3/16 or 1/16

Question			Answer	Marks	Part marks and guidance																	
7	a		Completes table with <table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>6</td><td></td><td>-2</td><td>-3</td><td></td><td>1</td><td></td></tr></table>								6		-2	-3		1		2	B1 for at least 2 correct values			
6		-2	-3		1																	
	b		Correct curve	3	B2 for 6 or 7 points correctly plotted FT <i>their</i> table or B1 for 4 or 5 points correctly plotted FT <i>their</i> table	Tolerance ± 2 mm for plotting and curve through the correct points. Strict marking of ‘smooth curve’ – must not be ruled or ‘feathered’																
	c		Straight line passing through (0, -6) and (3, 0)	3	M2 for a correct unruled line or a straight line of gradient 2 or a straight line passing through (0, -6) or two correct points correctly stated or plotted or M1 for one correct point stated or plotted	<table><tr><td>x</td><td>-1</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr><tr><td>y</td><td>-8</td><td>-6</td><td>-4</td><td>-2</td><td>0</td><td>2</td><td>4</td></tr></table>	x	-1	0	1	2	3	4	5	y	-8	-6	-4	-2	0	2	4
x	-1	0	1	2	3	4	5															
y	-8	-6	-4	-2	0	2	4															
	d		1.6 and 4.4	2FT	B1 for each or both answers as decimals to a greater accuracy Correct answer or FT <i>their</i> straight line	Tolerance ± 1 mm. Do not allow exact answers $3 + \sqrt{2}$ and $3 - \sqrt{2}$																

Question	Answer	Marks	Part marks and guidance	
8	7.2 oe nfw	4	M2 for $\frac{1}{3} \times 5 \times 5 \times \frac{h}{2} = 30$ oe or $\frac{1}{3} \times 5 \times 5 \times h = 60$ oe or $\frac{1}{3} \times 5 \times 5 \times h = 30$ oe or M1 for $\frac{1}{3} \times 5 \times 5 \left[\times \frac{h}{2} \text{ or } \times h \right]$ AND A1dep for $[h \text{ or } \frac{h}{2} =] 3.6 \text{ or } 7.2$	
9	a 2.5 5	3	B2 for $[k =] 2.5$ or B1 for $\binom{4}{2}$ B1 for $[n =] 5$	
9	b 		1 Correct arrow and label $\binom{5}{5}$ or a + 2b 1 Correct arrows on a and 2b 1 Correct labels on a and 2b	Accept single arrowhead

Question		Answer	Marks	Part marks and guidance	
10	a	$4 + 11 + 8 = 23$ seen	1		Accept written as a sum in a column
	b	e.g. First column: $n + (n + 7) + (n + 6) = 3n + 13$ Second column: $(n + 1) + (n + 8) + (n + 5) = 3n + 14$ $(3n + 14) - (3n + 13) = 1$	5	B2 for consistent algebraic terms for at least first two columns of the grid or B1 for at least 3 algebraic terms for consecutive numbers seen AND M1 for algebraic sum of first or second column shown M1 for algebraic sum of first and second columns shown and correctly simplified A1 for sum of second column – sum of first column = 1 calculated or explained from correct working or M1 for difference of one pair of algebraic terms from first and second column shown M1 for differences of two further pairs of algebraic terms from first and second column, with all three pairs correctly simplified A1 for each difference found as +1 or -1 oe and summed/explained to a difference of +1. Correct algebra and reasoning throughout If 0 scored, allow SC1 for a correct numerical or descriptive example using either method and stating an overall difference of 1	e.g. $n, (n + 7), (n + 6)$ and $(n + 1), (n + 8), (n + 5)$ e.g. $n, (n + 1), (n + 2)$ e.g. $n + (n + 7) + (n + 6)$ or in column e.g. $n + (n + 7) + (n + 6) = 3n + 13$ A1 for e.g. $3n + 14$ and $3n + 13$ and “second column is 1 more than the first” but A0 for e.g. $3n + 14$ and $3n + 13$ and “difference of 1” or for $(3n + 14) - 3n + 13 = 1$ e.g. “the difference between $n + 1$ and n is 1” e.g. “$n + 1$ is 1 more than n” Condone poor use of brackets for both M marks

Question			Answer	Marks	Part marks and guidance	
11	a	i	60	3	B2 for $[u_4 =] 15$ or M1 for $5 \times 6 - 15$	
		ii	4.2 oe	3	M2 for $(6 + 15) \div 5$ or M1 for $6 = 5u_2 - 15$ or $u_2 = \frac{u_3 + 15}{5}$	Allow $6 = 5k - 15$ or $u_n = \frac{u_{n+1} + 15}{5}$
	b		$[u_2 =] 5 \times 3.75 - 15 = 3.75$ Since $u_1 = u_2$, all terms are equal	1 1dep		Must see calculation and answer Accept “every term is 3.75”

Question		Answer	Marks	Part marks and guidance	
12	a	37 minutes 52 seconds to 37 minutes 53 seconds	4	B1 for 5000 or 0.0022 seen and M1 for figs 5 ÷ figs 22 oe soi by figs 2272 to 2273 and M1 for figs (2272 to 2273) ÷ 60 soi by figs 37[....]	
	b	19.09 20.19	6	B5 for 19.09 to 19.1 and 20.18 to 20.2 as final answers OR B2 for 53.5, 52.5, 2.65 and 2.75 all seen or B1 for two of 53.5, 52.5, 2.65 or 2.75 seen and M2 for both 53.5 ÷ 2.65 and 52.5 ÷ 2.75 or M1 for (52.5 to 53.5) ÷ (2.65 to 2.75) and A1dep for 19.09 to 19.1 and 20.18 to 20.2 If 0 scored, allow SC3 for one answer either 19.09 to 19.1 or 20.18 to 20.2	Allow 2.749[9...] for 2.75 or 53.49[9...] for 53.5 For M2 ignore other unnecessary divisions e.g. 53.5 ÷ 2.75 and 52.5 ÷ 2.65 Dep on M2

Question	Answer	Marks	Part marks and guidance	
13	$\frac{29}{66}$ oe	5	M4 for $\frac{2}{3} \times \frac{29}{44}$ OR B1 for [p(black) =] $\frac{2}{3}$ oe soi and B2 for $\frac{29}{44}$ or B1 for $\frac{n}{44}$ with $0 < n < 44$ or B1 for $\frac{29}{45}$ and M1 for $\frac{2}{3} \times \text{their } \frac{n}{44}$ or $\frac{2}{3} \times \frac{29}{45}$	
14	$2^{\frac{15}{4}}$ or $2^{3.75}$	3	B2 for 2^{15} or $2^{\frac{3}{4}}$ or $(2^3)^{5/4}$ or $3 \times \frac{1}{4} \times 5$ seen or B1 for [8 =] 2^3 or $8^{\frac{5}{4}}$ or $8^{1.25}$ seen	Accept equivalences of $15/4$

Question		Answer	Marks	Part marks and guidance	
15	a	e.g. 300-450: $150 \times 70 = 10\,500$ [parcels] 450-700: $250 \times 50 = 12\,500$ [parcels] [Zoe is] not correct oe	4	M2 for 150×70 and 250×50 or M1 for 150×70 or 250×50 AND A1 for 10 500 or 12 500 AND A1 10 500 and 12 500 and conclusion <u>Alternative method, for example:</u> M1 for 150×70 soi by 10 500 A1 for 10 500 AND M1 for <i>their</i> $10\,500 \div 250$ A1 for height of 450-700 bar is more than 42 so Zoe is not correct If 0 scored then SC2 for 10 500 and 12 500 with no method shown or SC3 for 10 500 and 12 500 with no method shown and correct conclusion	For full marks, calculations must be shown, together with a conclusion. Allow other equivalent methods involving consistent area calculations.
	b	Bar of height 130 drawn for 50-100g	2	M1 for $6500 \div 50$ soi by 130	
	c	The weights of parcels may not be evenly distributed [between 200g and 300g] oe	1		e.g. uneven distribution of weights

Question		Answer	Marks	Part marks and guidance	
16	a	50 nfw	4	M3 for $ABC = 25$ or $B = 25$ or for $AOB = 150$ and $COB = 160$ or M2 for $ABO = 15$ and $CBO = 10$ or for $AOB = 150$ or for $COB = 160$ or M1 for $ABO = 15$ or $CBO = 10$ If 0 scored, SC1 for $AOC = 2 \times [their] ABC$ stated or applied or for $360 - their AOB - their COB$ applied <u>Alternative method to find $AOC = x$</u> M3 for $\frac{x}{2} + 2\left(\frac{180-x}{2}\right) + 15 + 10 = 180$ oe OR M1 for $OAC = OCA = \frac{180-x}{2}$ and M1 for $ABC = \frac{x}{2}$ <u>Alternative method to find $AOC = x$</u> M3 for $360 - x + 10 + 15 + \frac{x}{2} = 360$ OR M1 for [reflex] $AOC = 360 - x$ and M1 for $ABC = \frac{x}{2}$	Throughout, angles could be on diagram SC0 for angle at centre = $2 \times$ angle at circumference

Question		Answer	Marks	Part marks and guidance	
	b	e.g. $DEF = 180 - (43 + 55) = 82$ angles in a triangle $HDF = DEF = 82$ alternate segment theorem OR $GDE = 55$ alternate segment theorem $HDF = 180 - (43 + 55) = 82$ angles on a straight line	4	M2 for $[DEF =] 180 - (43 + 55)$ soi by $DEF = 82$ and angles in a triangle or M1 for $[DEF =] 180 - (43 + 55)$ soi by $DEF = 82$ AND M2 for $HDF = DEF [= 82]$ and alternate segment theorem or M1 for $HDF = DEF [= 82]$ <u>Alternative method</u> M2 for $GDE = 55$ and alternate segment theorem or M1 for $GDE = 55$ AND M2 for $[HDF =] 180 - (43 + 55) [= 82]$ and angles on a straight line or M1 for $[HDF =] 180 - (43 + 55) [= 82]$	Allow full marks if 3 letter angle notation not used provided their angles are unambiguously defined (eg. labelled on the diagram and referred to in working using their labels) Note: $180 - (43 + 55)$ with no other creditable working or reasoning scores M1
17	a	(10, 11)	2	B1 for a ray drawn through either point A and (6, 7) or point B and (2, 9)	
	b	-2	2	B1 for 2	
	c	(4, 1)	2	B1 for (4, k) or (k, 1)	