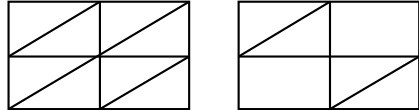


Throughout mark scheme, accept missing non-critical zeroes such as .28 for 0.28 or £1.3 for £1.30 unless otherwise stated.

Question			Answer	Marks	Part marks and guidance	
1	(a)	(i)	[an] odd [number]	1		
		(ii)	[a] prime [number]	1		
	(b)	(i)	24 and 28 only	1		
		(ii)	$12n$	1		Where n is integer. 12, 24, 36, 48, ...
	(c)		$(4 - 1) \times 2$	1		
	(d)		$\frac{7}{100}$	1		Accept equivalent proper fractions
2			1.6	2	B1 for 1520 or 0.08[0]	Accept 1.60 and 1.600
3	(a)		33 000	1		
	(b)		30 000	1		
4	(a)		31.4 to 31.42	2	B1 for $2\pi r$ or πd only seen or used	0 marks if $2\pi r$ or πd and πr^2 seen and wrong one used
	(b)		78.5 to 78.55	2	B1 for πr^2 only seen or used	0 marks if $2\pi r$ or πd and πr^2 seen and wrong one used
5			29	2	M1 for 16×2 soi 32	May be $16 \times 2 - 3$
6	(a)		Cat	1		

Question		Answer	Marks	Part marks and guidance	
	(b)	Correct graph	3	<p>B2 for two correct bars or three correct height bars but not all correct width</p> <p>or</p> <p>B1 for one correct height bar of any width or one of [mouse] 2 or [dog] 7 or [horse] 6 seen</p> <p>If 0 scored, allow B1 for [dog] 84.</p>	<p>Three correct heights and correct widths with no daylight</p> <p>Condone freehand with lines on gridlines (no daylight).</p> <p>Use overlay</p> <p>Number associated with correct animal</p>
7	(a)	$\frac{28}{100}$ oe or 0.28 or 28%	1		Do not accept ratio or in words Ignore attempts to change to decimals or cancel once correct answer seen
	(b) (i)	Blue	1		
	(ii)	Yellow is [a sector] on the spinner oe or Yellow is a possible outcome oe	1		Anything saying the spinner can land on yellow or yellow is on the spinner. Contradictory statements score 0.
8	(a)	Correct ruled rotation	2	B1 for correct rotation but lines unruled or Ruled but one vertex just outside tolerance or rotation of 180° about another point and ruled and with vertices in tolerance	Use overlay as a guide. Set screen to zoom 57%. Vertices to be within overlay circles
	(b)	Correct ruled enlargement	2	B1 for correct unruled enlargement or ruled enlargement with one vertex just outside tolerance enlargement sf 2 but from different point	Use overlay as a guide. Set screen to zoom 57%. Vertices to be within overlay circles for all marks For B1 , enlargement must fit on grid point

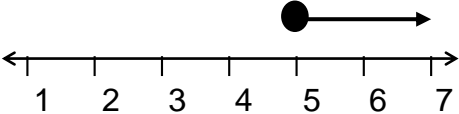
Question		Answer	Marks	Part marks and guidance	
9		40 : 48 linked to 5 : 6 or 100 : 120 linked to 5 : 6 or 1 : 1.2 linked to 5 : 6	3	B2 for 48 or 120 or B1 for 8	40 : 48 = 5 : 6 is enough. Allow $\frac{40}{48} = \frac{5}{6}$ for 3 marks
10	(a)	[BY] GY RY BW GW RW BP GP RP	2	B1 for 6 or more correct with repeats and/or errors or B1 for 4 to 7 correct with no repeats and/or errors	Number does not include BY Mark only the contents of the table unless clearly a restart or table continued
	(b)	Not a random choice oe	1	Accept explanations suggesting unequal / not random EG Grey and pink do not match and so less likely to be used; she may not like the colours and so won't choose them, it's a decision...	Anything suggesting she may have a preference or that colours would not "go together"
11	(a)	$3x - 6$ final answer	1		
	(b)	$2a^2 + 2ab$ final answer	2	B1 for $2a^2$ or $2ab$ in final answer	Do not accept $2aa$ for 2 marks but condone for 1 mark
12	(a)	(i)	6	1	
		(ii)	256	1	
	(b)	$3^3 + \sqrt{7}$ final answer	1		Accept clear indication

Question		Answer	Marks	Part marks and guidance	
13		75 cao nfww	4	<p>M1 for inventing a length and width and correct answer to <i>their</i> length \times <i>their</i> width</p> <p>M1 for correct area of one triangle</p> <p>M1 for <i>their</i> rectangle area $- 2 \times$ <i>their</i> triangle area oe</p> <p>OR</p> <p>M1 for subdividing shape into right triangles and/or rectangles</p> <p>B2 for shaded area = $\frac{6}{8}$ oe of rectangle or</p> <p>B1 for one triangle = $\frac{1}{8}$ oe or 12.5% of rectangle oe</p> <p>OR</p> <p>M1 for recognising two triangles = rectangle</p> <p>B2 for shaded area = $\frac{3}{4}$ or oe $\frac{6}{8}$ of rectangle or</p> <p>M1 for two triangles = $\frac{1}{4}$ or $\frac{2}{8}$ oe or 25% of rectangle</p>	<p>May be algebraic “xby y” rectangle (Diagram is 11 cm by 5 cm) Accept equal length and width Or a trapezium = half shaded area</p> <p>May be 6 \times one triangle or 2 \times one trapezium</p> <p>e.g. </p> <p>May be as 8 triangles make the rectangle</p> <p>May be as 8 triangles or 4 rectangles make the rectangle</p> <p>Example for 11 by 5</p> <p>M1 for $11 \times 5 = 55$</p> <p>M1 for $5.5 \times 2.5 \div 2 = 6.875$</p> <p>M1 for $55 - 13.75 = 41.25$</p>
14	(a)	157	2	M1 for $103 + 100$ soi 203	

Question		Answer	Marks	Part marks and guidance	
	(b) (i)	Angles [on a straight] line add to 180° or 180 – 130 [= 50] oe	1		Key words “Angle[s]”, “line” and “180” must be seen If reason and calculation seen, mark the best
	(ii)	80 final answer ACB = 50 isosceles [triangle] One from ABC = 80 angles in a triangle = 180 CBY = 100 angles on a straight line = 180 or exterior angle ACW = 130 alternate angles [are equal]	2 1 1		80 may be seen on diagram Allow one letter for angle when usage makes clear e.g. B = 80 isosceles Reasons must be geometric e.g. angles on a straight line add to (allow =) 180 or Isosceles triangle Do not accept AB = BC for isosceles Do not accept e.g. Z angles for alternate Do not accept drawings as a reason
15	(a)	Correct tree diagram	2	B1 for $\frac{1}{3}$ correctly placed on first branch B1 for $\frac{3}{5}$ and $\frac{2}{5}$ correctly placed on both sets of second branches	Accept equivalent fractions and decimals with $\frac{1}{3}$ at least 0.33
	(b) (i)	$\frac{2}{15}$ oe nfw	2	FT their (a) M1 for their $\frac{1}{3} \times$ their $\frac{2}{5}$	FT their fractions < 1 Ignore attempts to cancel or change to decimal or percentage once correct answer seen Do not accept words or ratios Accept 0.13[3...] or 13[.3...]% If no working seen answer must be correct

Question			Answer	Marks	Part marks and guidance
		(ii)	$\frac{13}{15}$ oe nfww	2	<p>FT <i>their</i> (i)</p> <p>M1 for $1 - \textit{their} \frac{2}{15}$</p> <p>ALTERNATIVE with each of <i>their</i> fractions < 1</p> <p>M1 for $\frac{2}{3} \times \frac{3}{5} + \frac{2}{3} \times \frac{2}{5} + \frac{1}{3} \times \frac{3}{5}$ or $\frac{2}{3} + \frac{1}{3} \times \frac{3}{5}$</p> <p>FT their fractions < 1 Do not accept words or ratios Accept 0.86 to 0.87 or 86% to 87% If no working seen answer must be correct Ignore attempts to cancel or change to decimal or percentage once correct answer seen</p> <p>May be implied by $\frac{6}{15} + \frac{4}{15} + \frac{3}{15}$ or $\frac{2}{3} + \frac{3}{15}$</p>
16			[x=] 3 [y=] -1	3	<p>M1 for correct method to eliminate one variable</p> <p>B1 for $x = 3$</p> <p>B1 for $y = -1$</p> <p>If 0 scored SC1 for correct substitution in a given equation and correct evaluation to find other variable</p> <p>Allow one error in addition or subtraction of terms or in rearrangement</p> <p>If previously rearranged must be correct rearrangement</p>
17			25, 50, 75, 150	5	<p>B4 for 25, 50, 75 seen or B3 for two from 25, 50, 75 seen or B2 for one from 25, 50, 75 seen or M1 for car A associated with 5</p> <p>Mark answer line first and accept numbers on the line as answers Only look back into working if answer line blank</p>
18	(a)		2.4	1	

Question		Answer	Marks	Part marks and guidance	
	(b) (i)	Percentages are not of the same amount oe	1	If calculation used 10% of 1500 = 150 80% of 1650 = 1320 1500 – 150 = 1350 It has lost more [than 10%]	If calculation, must contain all four steps Accept anything that suggests 20% is of a different amount [than 1500]
	(ii)	12 nfww	5	<p>M3 for $1500 \times \left(1 - \left(1 + \frac{10}{100}\right)\left(1 - \frac{20}{100}\right)\right)$ oe possibly implied by 180</p> <p>or</p> <p>M2 for $1500 \times \left(1 + \frac{10}{100}\right) \times \left(1 - \frac{20}{100}\right)$ oe possibly implied by 1320</p> <p>or</p> <p>M1 for $\times \left(1 + \frac{10}{100}\right)$ oe possibly implied by 1650</p> <p>AND</p> <p>M1 for $\frac{\textit{their} 180}{1500} [\times 100]$ oe</p>	If non calculator methods, must show operations to score method marks M3 for $1500 \times (1 - 1.1 \times 0.8)$ May be in stages e.g $1500 \div 10 = 150$ M1 $1500 + 150 = 1650$ $1650 \div 10 \times 2 = 330$ M2 $1650 - 330 = 1320$ M3 $1500 - 1320 = 180$ M1 $180 \div 1500 \times 100 = 12$ ALTERNATIVE not using 1500 B1 for 1.1 or 110% B1 for 0.8 or 80% M1 for 1.1×0.8 soi 0.88 M1 for $(1 - \textit{their} 0.88) \times 100$

Question	Answer	Marks	Part marks and guidance
19	<p>$x \geq 5$</p> <p>AND</p> 	4	<p>B2 for $x \geq 5$ as final answer or M1 for $3x \geq 10 + 5$ or better</p> <p>AND</p> <p>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</p>

Solution to inequality

Allow **M1** for this expression with other inequality symbols or equals sign or $[x =] 5$ 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
Diagram must show an inequality that fits on the number line for FT
Mark to candidate's advantage either $x \geq 5$ or *their* inequality
Accept a line or arrow

If no solution to inequality seen:
Filled circle at 5 arrow to right **M1 B2**
Empty circle at 5 arrow to right **M1 B1**
Filled circle at 5 arrow to left **M1 B1**
Empty circle at 5 arrow to left **M1 B0**
Mark at 5 no line or arrow **M1B0**
Circle and/or arrow at other than 5 **M0B0**

Question	Answer	Marks	Part marks and guidance	
20	31 218	5	<p>M4 for $54868 - \frac{54868}{2.32}$ oe</p> <p>or</p> <p>M3 for $\frac{54868}{2.32}$ soi by 23650 or 236.5</p> <p>or</p> <p>M2 for 2.32 or 232[%] soi</p> <p>or</p> <p>M1 for 1.32 or 132[%] soi</p> <p>If M1 only scored then also allow an SC1 for $\frac{54868}{1.32}$ soi by 41566 to 41567</p>	<p>May be seen as</p> $54868 \times \frac{132}{232} \text{ or } 236.5 \times 132$ <p>Examples of implied:</p> <p>2.32 implied by [A =] 0.32B + 2B oe but not by 32[%] × B + 2B oe</p> <p>1.32 implied by 0.32 + 1 but not by 32[%] + 1 nor 0.32 + 100[%]</p>
21	$\frac{1}{27}$	3	<p>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[...]%</p> <p>or</p> <p>B1 for $\frac{2}{6}$ oe</p> <p>If 0 scored then SC1 for $(\text{their } (\frac{2}{6}))^3$ oe</p>	$0 < \text{their } (\frac{2}{6}) < 1$

Question	Answer	Marks	Part marks and guidance	
22	80 nfw	5	<p>B3 for height [of B =] 10</p> <p>OR</p> <p>M2 for $3x^2 = \textit{their}$ (12 × 25) or better</p> <p>or</p> <p>M1 for $3x \times x$ oe or 300 seen A1 for $x = 10$</p> <p>AND</p> <p>M1 for $(2 \times \textit{their} 10) + (2 \times 3 \times \textit{their} 10)$ oe or for $2a + 2b$ where $ab = 300$ but not with 25 and 12</p>	<p>May be seen on diagram</p> <p>May be implied by arithmetic processing e.g. $\sqrt{\frac{\textit{their} (12 \times 25)}{3}}$ or at least two trials of $3 \times \text{number} \times \text{number}$ intending 300</p> <p>Allow <i>their</i> 10 if clearly intended as height e.g. “$h =$” or marked on diagram e.g. M1M1 for $2 \times 36 + 2 \times 8.3[3\dots]$</p>

Question	Answer	Marks	Part marks and guidance
23	3.2 nfw	6	<p>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</p> <p>AND</p> <p>M2 for $\frac{\textit{their } 1738.91 - 1500}{5 \times 1500} [\times 100]$ oe or M1 for $(\textit{their } 1738.91 - 1500) \div 5$ or for $(\textit{their } 1738.91 - 1500) \div 1500$</p> <p><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</p>
			<p>Condone 3.2% as final answer soi by 1738 to 1739</p> <p>soi by [2 yr =] 1591[.35], [3 yr =] 1639[.09..] or [4 yr =] 1688.[26...]</p> <p><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</p>

Question		Answer	Marks	Part marks and guidance	
24		18 nfw	6	<p>B4 for $2a = 5$ OR M3 for $6a - 4a = 8 - 4 + 1$ or better or M2 for $6a + 4 - 1 = 4a + 2 \times 4$ or better or $6a - 4a = 2b - b + 1$ or better or M1 for $6a + b - 1 = 4a + 2b$</p> <p>AND</p> <p>M1dep for correct substitution of 4 and <i>their</i> 2.5 in $4a + 2b$ or $6a + b - 1$</p>	<p>Isolating a</p> <p>Expect $6a + 3 = 4a + 8$ Expect $2a = b + 1$</p> <p>Dependent on at least M1 or B4 May be implied by $10 + 8$ or $15 + 3$</p>
Total			100		

Question	Example	Mark	Reason
7bii	It can't be the actual probability because there is a yellow ball in the bag	1	BOD the reference to balls, reward recognition yellow exists
	If you did it again you (could) land on yellow	1	Recognises yellow is an outcome
	She could get yellow as it in the spinner	1	Recognises yellow is on the spinner
	Her spinner is biased so would land on yellow if it was spun over 100 times	1	Recognises yellow is on spinner
	The spinner is biased. The probability of yellow is not the actual one.	0	Does not say yellow is on the spinner
	The total would not add up to 100. Yellow would have to be 12	0	Does not say yellow is on the spinner
	Because she has no yellows	0	Does not say yellow is on the spinner
	Because she has a biased 5 sided spinner	0	Does not say yellow is on the spinner