1	e.g. $\frac{3}{"10"}\times 80(=24)$ **or** $\frac{2}{"10"}\times 80(=16)$ **or** $\frac{5}{"10"}\times 80(=40)$		5	M2	for a complete method to find the number of chocolate cakes **or** lemon cakes **or** fruit cakes "10" comes from $3 + 2 + 5$
				(M1	for correct use of the ratio e.g. $80 \div "10" (= 8))$
	e.g. "16" $\times \frac{3}{4} \times 1.7(0)\ (= 20.4(0))$ **or** "40" $\times \frac{7}{8} \times 2.4(0)\ (= 84)$			M1	for a method to find the profit for lemon cakes **or** fruit cakes
	e.g. "24" $\times 2\ (= 48)$ **and** "16" $\times \frac{3}{4} \times 1.7(0)\ (= 20.4(0))$ **and** "40" $\times \frac{7}{8} \times 2.4(0)\ (= 84)$			M1	for a method to find the profit for all 3 cakes
		152.4(0)		A1	
					Total 5 marks

2	eg $76 \div (5 + 2 - 3)$ oe (= 19) or $5x + 2x - 3x = 76$ **and** $x = 76 \div (5 + 2 - 3)$ (=19) oe			M1	For a correct method to find the value of 1 share
	$3 \times "19" (= 57)$			M1	
	"57" − 48.5(0)			M1	
		8.5(0)	4	A1	
					Total 4 marks

3	e.g. $36 \div (2 + 6)\ (= 4.5)$ **or** $36 \div \frac{2+6}{3+2+6} (= 49.5)$ oe **or** Asha = £9 **OR** Julie = £27			M1	
	e.g. $3 \times$ "4.5" **or** "49.5"$\times \frac{3}{3+2+6}$ **or** "9"$\times\frac{3}{2}$ **or** "27"$\times\frac{3}{6}$			M1	or an answer of $\frac{27}{2}$
		13.5(0)	3	A1	SCB1 for $36/5 \times 6$ (=43.2) or $36/9 \times 2$ (=8)
					Total 3 marks

4	$120 \div (3 + 5)\ (= 15)$		6	M1	M2 for
	'15' $\times 3\ (= 45)$ **or** '15' $\times 5\ (= 75)$			M1	$\frac{3}{8}\times 120 (= 45)$ **or** $\frac{5}{8}\times 120 (= 75)$ oe
	'45' $\div 3\ (= 15)$ **or** '45' $\div 3 \times 2\ (= 30)$			M1	
	'75' $\times \frac{16}{25}\ (= 48)$ **or** '75' $\times \frac{9}{25}\ (= 27)$			M1	
	E.g. ('45' $\div 3 \times 2$) + ('75' $\times \frac{9}{25}$) oe **or** '27' + '30' **or** ('75' − '48') + ('45' − '15')			M1 for a complete method	
		57		A1	
					Total 6 marks

5	eg $(36 \div 9) \times 5$ **or** 20 [ducks] **or** 20 : 36 **or** for writing the 3 parts of the ratio correctly eg 35 : 10 : 18 oe		3	M1	For a fully correct calculation for the number of ducks or stating 20 ducks – may be shown in a ratio – does not need to be labelled if it is clear that the number or calculation refers to the number of ducks
	"20" $\div 2 = 10$ **and** 10×7 oe **or** $\frac{36}{18}\times 35$ oe			M1	For a correct calculation to find the number of chickens. (award the M2 for 70 : 20 : 36 or a different order if intention is clear eg by labels)
	Working not required, so correct answer scores full marks (unless from obvious incorrect working)	70		A1	
					Total 3 marks

6	e.g. $0.7 \times 20\,160$ oe $(= 14\,112)$ **or** $0.3 \times 20\,160$ oe $(= 6048)$		4	M1	
	e.g. "$14\,112$" $\div (9 + 5 + 2)$ $(= 882)$ **or** $(20\,160 - "6048") \div (9 + 5 + 2)$ $(= 882)$			M1	M2 for $\dfrac{9-2}{9+5+2} \times$ "$14\,112$" oe
	e.g. $9 \times$ "882" $- 2 \times$ "882"			M1	
		6174		A1	
					Total 4 marks

7	$300 \div (7 + 5 + 3)$ $(= 20)$ **clear correct use** of $7 + 5 + 3$ $(= 15)$ eg division at the end by 15 $\left(\dfrac{"2.8"+"1.8"}{15}\right)$ or correct use of 15 in a fraction eg $\dfrac{2}{5} \times \dfrac{7}{15}$		5	M1	(no mark for "15" unless it is used correctly) use of 7×20 or 140 or 5×20 or 100 in further work assumes this mark
	$\dfrac{2}{5} \times (7 \times "20") (=56)$ oe eg $0.4 \times "140"$ $(= 56)$ or $\dfrac{2}{5} \times 7 \left(=\dfrac{14}{5}=2.8\right)$ eg $\dfrac{2}{5} \times \dfrac{7}{15}\left(=\dfrac{14}{75}=0.186...\right)$			M1	finding $\dfrac{2}{5}$ of the number of birthday cards or $\dfrac{2}{5}$ of the share of 7 or $\dfrac{2}{5}$ of fraction of amount
	$0.36 \times (5 \times "20")(=36)$[from working] or 0.36×5 $(= 1.8)$ eg $\dfrac{36}{100} \times \dfrac{5}{15}\left(=\dfrac{180}{1500}=0.12\right)$ oe			M1	finding 36% of anniversary cards Or 36% of the share of 5 or 36% of fraction of amount
	$\dfrac{"56"+"36"}{300}$ $(=\dfrac{92}{300}$ $)$ or eg $\left(\dfrac{"2.8"+"1.8"}{15}\right)$ or $\dfrac{\dfrac{14}{5}+\dfrac{9}{5}}{15}$ "$\dfrac{14}{75}$"$+$"$\dfrac{180}{1500}$"			M1	for any fraction from correct working that isn't simplified or 30.66..% or 0.3066...
		$\dfrac{23}{75}$		A1	
					Total 5 marks

8	$196 \div (9 - 5)$ $(= 49)$ oe		3	M1	
	$3 \times "49"$			M1	
		147		A1	SCB1 for an answer from 34.5 – 34.6 **or** an answer of 42
					Total 3 marks

9	$28 \div 0.35 \ (= 80)$ oe eg $(28 \div 7) \times 20 \ (= 80)$		5	M1	indep for calculating total number of sweets
	$1 - (0.2 + 0.35) \ (= 0.45)$ oe **or** $(0.2 + 0.35) \times$ "80" $(= 44)$ or $28 +$ "16" $(= 44)$			M1	or for a correct equation for missing values eg $x + 2x + 0.2 + 0.35 = 1$ oe (can be implied by 2 probabilities that total 0.45 in table if not contradicted in working space)
	"0.45" $\div 3 \ (= 0.15)$ oe **or** "0.45" $\times$ "80" $(= 36)$ **or** "80" $-$ "44" $(= 36)$			M1	(or 0.15 or 0.3 seen in table – either order)
	"80" $\times$ "0.15" **or** "80" $\times$ "0.3" $(= 24)$ **or** "36" $\div 3$ or "36" $\div \dfrac{3}{2} (= 24)$			M1	A correct calculation for the number of white sweets or the number of pink sweets
		12		A1	
9 alt	$1 - (0.2 + 0.35) \ (= 0.45)$ or $100(\%) - 20(\%) - 35(\%) = 45(\%)$		5	M1	or for a correct equation for missing values eg $x + 2x + 0.2 + 0.35 = 1$ oe
	"0.45" $\div 3 \ (= 0.15)$ or $45(\%) \div 3 \ (= 15(\%))$			M1	(or 0.15 or 0.3 seen in table – either order)
	$\dfrac{n}{28} = \dfrac{0.15}{0.35}$ or $\left(\dfrac{n}{0.15}\right) = \dfrac{28}{0.35}$ oe or $\dfrac{..}{28} = \dfrac{..}{0.35}$ or $\left(\dfrac{..}{0.3}\right) = \dfrac{..}{0.35}$ or $35\% = 28$ so $5\% = 4$			M1	for using proportion with an expression for n white sweets or finding 5% oe to enable calculation to 15%
	$(n =) \ 28 \times \dfrac{0.15}{0.35}$ **or** $(n =) \ 0.15 \times \dfrac{28}{0.35}$ or $15\% = 3 \times 4$ or $28 \times \dfrac{0.5}{0.35}$ **or** $0.3 \times \dfrac{28}{0.35}$ or $30\% = 6 \times 4 \ (= 24)$			M1	a calculation using proportion that would lead to finding their n or $2n$
		12		A1	
					Total 5 marks

10	$390 \div (8 - 2) \ (= 65)$ or $\dfrac{8}{15} - \dfrac{2}{15} = 390$ or $\dfrac{8}{15}x - \dfrac{2}{15}x = 390$ or $\dfrac{6}{15} = 390$ or $\dfrac{6}{15}x = 390$ oe		3	M1	M2 for $\dfrac{390 \times 15}{6}$ oe
	"65" $\times (2 + 5 + 8)$ oe or $\dfrac{1}{15} = 65$ or $\dfrac{1}{15}x = 65$ or $\dfrac{1}{5} = 195$ or $\dfrac{1}{5}x = 195$			M1	or for 975 seen with further work and a different answer
	Correct answer scores full marks (unless from obvious incorrect working)	975		A1	SCB1 for 52, 130, 208 or 390, 975, 1560 (or 2925) or 97.5, 243.75, 390 (or 731.25)
					Total 3 marks

11	$2 : 3 : 15$ oe or 20 or $(1 : 5) \times 3$ or $(1 : 5 =) \ 3 : 15$ or $2n : 3n : 15n$ e.g. $4 : 6 : 30$ or G(reen) = 2, O(range) = 3 , Y(ellow) = 15		3	M1	
	$\dfrac{2}{"20"} \times 280$ oe or 14×2 or $\dfrac{2}{"2" + "3" + "15"} \times 280$ oe or $\dfrac{2n}{"2n" + "3n" + "15n"} \times 280$ oe			M1	
	Correct answer scores full marks (unless from obvious incorrect working)	28		A1	or $28 : 42 : 210$ or $28 , 42 , 210$ If not in this order must be labelled correctly
					Total 3 marks

12	$12 \div (5 - 2) \ (= 4)$ or $2 : 5 = 8 : 20$ or $A = 8$ or $S = 20$ or eg $\dfrac{5}{15}x - \dfrac{2}{15}x = 12$ or $x = 60$		3	M1	for method to find the value of one share **or** working with the ratio for Arjun or Simon **or** setting up an equation **or** for finding the total number of goals $(= 60)$	M2 for $\dfrac{8}{5 - 2} \times 12$ oe
	eg $8 \times$ "4" **or** $8 \times \dfrac{8}{2}$ **or** $8 + 12 + 12$ or $8 \times \dfrac{20}{5}$ or $20 + 12$ or "60" $\times \dfrac{8}{15}$			M1	for a complete method	
	Correct answer scores full marks (unless from obvious incorrect working)	32		A1	SCB1 for $\dfrac{8}{15} \times 12 (= 6.4)$	
					Total 3 marks	

13	(b)	eg $\overrightarrow{OP} = \mathbf{a} + y(-\mathbf{a} + 6\mathbf{b})$ and $\overrightarrow{OP} = 2\mathbf{a} + x("-2\mathbf{a} + \mathbf{b}")$ $\overrightarrow{AP} = -\mathbf{a} + y(-\mathbf{a} + 6\mathbf{b})$ and $\overrightarrow{AP} = x("-2\mathbf{a} + \mathbf{b}")$ $\overrightarrow{AB} = x("-2\mathbf{a} + \mathbf{b}") + y(-\mathbf{a} + 6\mathbf{b})$ and $\overrightarrow{AB} = -2\mathbf{a} + 6\mathbf{b}$ $\overrightarrow{NP} = -\mathbf{b} + \mathbf{a} + y(-\mathbf{a} + 6\mathbf{b})$ and $\overrightarrow{NP} = x("2\mathbf{a} - \mathbf{b}")$ $\overrightarrow{MP} = x(-\mathbf{a} + 6\mathbf{b})$ and $\overrightarrow{MP} = \mathbf{a} + y("-2\mathbf{a} + \mathbf{b}")$	4	M2	ft from (a), for writing eg $\overrightarrow{OP}$ or $\overrightarrow{AP}$ or $\overrightarrow{AB}$ or $\overrightarrow{NP}$ or $\overrightarrow{MP}$ or similar in two different ways in terms of $\mathbf{a}$ and $\mathbf{b}$ (M1 for writing eg $\overrightarrow{OP}$ or $\overrightarrow{AP}$ or $\overrightarrow{AB}$ or $\overrightarrow{NP}$ or $\overrightarrow{MP}$ or similar in one way in terms of $\mathbf{a}$ and $\mathbf{b}$) These may be written as eg $\overrightarrow{PO}$ in place of $\overrightarrow{OP}$
		eg $x = 6y$ and $2 - 2x = 1 - y$ (from $\overrightarrow{OP}$) $x = 6y$ and $-2x = -1 - y$ (from $\overrightarrow{AP}$) $6 = x + 6y$ and $-2 = -2x - y$ (from $\overrightarrow{AB}$) $2x = 1 - y$ and $-x = -1 + 6y$ (from $\overrightarrow{NP}$) $-x = 1 - 2y$ and $6x = y$ (from $\overrightarrow{MP}$)		M1	dep M2 for writing a pair of equations using their variables $\overrightarrow{OP}$ leads to $x = \frac{6}{11}, y = \frac{1}{11}$ $\overrightarrow{AP}$ leads to $x = \frac{6}{11}, y = \frac{1}{11}$ $\overrightarrow{AB}$ leads to $x = \frac{6}{11}, y = \frac{10}{11}$ $\overrightarrow{NP}$ leads to $x = \frac{5}{11}, y = \frac{1}{11}$ $\overrightarrow{MP}$ leads to $x = \frac{1}{11}, y = \frac{6}{11}$
		Vector method required	6 : 5	A1	dep on M2, oe eg $\frac{6}{11} : \frac{5}{11}$

14	2 and 15 seen or $1 \times 2 (+) 3 \times 5 (= 17)$	$2x + 15x (= 85)$ or $\frac{2}{3}y + 5y(= 85)$ or $0.25t \times 2 + 0.75t \times 5 (= 85)$		4	M1	For 2 and 15 oe seen or 17 or a correct equation in one unknown for number of 2p coins (x) or number of 5p coins (y) or total number of coins (t)
	$85 \div (2 + 15) (= 5)$ or at least two pairs of multiples of the values of 2 and 15 (eg 4, 30; 6, 45.....) or 10(p) (and) 75(p) or 10 : 75 or 5×2 and 15×5 $2 \times 5 + 5 \times 3 \times 5$ or 20 coins	$17x = 85$ ($x = 5$) or $\frac{17}{3}y = 85$ ($y = 15$) or $4.25t = 85$ ($t = 20$)			M1	Assumes previous M1 for number of 2p coins **or** number of 5p coins **or** total number of coins **or** value of 2p coins **and** value of 5p coins may be **clearly** listed eg 2 555 2 555 2 555 2 555 2 555 with no ambiguity
	5 (2p coins) and 15 (5p coins) or 5 : 15 (if clearly identified (or used) as the key ratio eg not just part of a list) or $(3 - 1) \times 5$	eg $15 - 5$ oe			M1	Correct number of 2p coins **and** 5p coins or a sum to find the difference in number of coins
	Correct answer scores full marks (unless from obvious incorrect working)		10		A1	SCB1 if no other marks awarded for 21.25 in working or on answer line
						Total 4 marks