PROBABILITY

Pearson Edexcel - Tuesday 19 May 2020 - Paper 1 (Non-Calculator) Higher Tier

1.

14	0.42	P1 P1 A1	for appropriate multiplication eg 0.3×0.7 (=0.21) **or** 0.3×0.1 (=0.03) **or** 0.3×0.6 (=0.18) (dep) for complete process eg $0.3 \times 0.7 + 0.7 \times 0.3$ **or** $0.3 \times 0.1 + 0.3 \times 0.6 + 0.6 \times 0.3 + 0.1 \times 0.3$ oe	Probabilities could also be given in fraction or percentage form Acceptable equivalents are 42% or $\frac{42}{100}$ oe

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2.

11	Yes (supported)	P1 C1	for process to find number of combinations, eg 5×8 oe (= 40) **or** for $240 \div 5$ (= 48) **or** $240 \div 8$ (= 30) **or** for $240 \div 5 \div 8$ (= 6) **or** $5 \times 8 \times x = 240$ Yes **and** 6	

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3.

20 (a)	Shown	M1 M1 C1	for $\frac{n}{n+8}$ **or** starts to work with ratios, eg 3:7 forms equation and clears fractions, eg $10n = 7n + 56$ or $10n + 3(n + 8) = 10(n + 8)$ **or** equates $\frac{3}{10} = \frac{8}{x}$ or $\frac{3}{10} = \frac{8}{n+8}$ **or** continues to work with ratios, eg 3:7 = 24:56 gives the total sweets eg $\frac{80}{3}$ oe **or** number of red sweets $n = \frac{56}{3}$ oe **or** gives number of red as $\frac{56}{3}$ **OR** award 3 marks for a complete written argument, eg, P(y) = $\frac{3}{10}$ and there are 8 yellows. This cannot work as 3 is not a factor of 8 (and $\frac{3}{10}$ is in its simplest form)	Does not have to restate the $\frac{7}{10}$; giving a different probability will suffice

20	(b)	28	P1	for $\frac{n}{n+8}$ and $\frac{n-1}{n+7}$ oe	
			P1	forms an appropriate equation, eg $\frac{n}{n+8}\times\frac{n-1}{n+7}=\frac{3}{5}$	
			P1	for correctly forming a quadratic ready for solving, eg an^2+bn+c (= 0), $2n^2-50n-168$ (= 0), $n^2-25n-84$ (= 0) oe	Note we do not need to see "= 0"; just the LHS is sufficient.
			P1	process to solve quadratic equation, ft a 3 term quadratic factorising eg $(n+3)(n-28)$ (=0) oe **or** completing the square **or** correct use of formula eg $\frac{--25\pm\sqrt{25^2-4\times-84}}{2}$, $\frac{--50\pm\sqrt{50^2-4\times2\times-168}}{2\times2}$	
			A1	cao	Award 0 marks for a correct answer with no supportive working.

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4.

8	24	P1	for start to process of working out the unknown probabilities, eg 1 − 0.32 − 0.20 (= 0.48) **or** assigning probabilities as $5x$ and x **or** process to work out the number of blue or green counters, eg 0.32 × 300 (= 96) or 0.20 × 300 (= 60) or 0.52 × 300 (= 156)	Award for P(R) + P(Y) = 0.48, may be seen in table
		P1	for process to find the probability, eg $5x+x$ = "0.48" or "0.48" ÷ 6 (= 0.08) **or** process to find the number of red or yellow counters, eg 300 − "96" − "60" or 300 × "0.48"	
		A1	cao	

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5.

1	(a)	0.4, 0.4	P1	for process to find sum of unknown probabilities, eg 1 – 0.2 (= 0.8)	Award mark for any two probabilities given that sum to 0.8, eg given in the table
			A1	oe	Accept any equivalent fraction or 40%
	(b)	60	P1	for complete process to find total number of cubes, eg 12 ÷ 0.2 **or** 12 × 5 **or** ("0.4" ÷ 0.2) ×12 + ("0.4" ÷ 0.2) ×12 + 12 **OR** states 0.1 = 6 **or** 0.4 = 24	
			A1	cao	

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6.

22	12 red, 9 green	P1 P1 P1 P1 A1 P1 P1 P1 P1 A1	for process to find a relationship between r and g eg $\frac{g}{r+g}=\frac{3}{7}$ **or** $\frac{g}{r}=\frac{3}{4}$ for process to find a second relationship between r and g eg $\frac{g+3}{r+2+g+3}=\frac{6}{13}$ **or** $\frac{g+3}{r+2}=\frac{6}{7}$ (dep P2) for start to process of solving pair of equations, eg eliminates one variable from the equations **or** removes fractions from both equations (dep P3) for complete process to solve equations to find g **or** r cao **OR** for two of $3x + 3$, $4x + 2$ and $7x + 5$ for $\frac{3x+3}{7x+5}=\frac{6}{13}$ (dep P2) for removing fractions from the equation, eg $13(3x + 3) = 6(7x + 5)$ **or** $39x + 39 = 42x + 30$ (dep P3) for complete process to solve $13(3x + 3) = 6(7x + 5)$ cao	

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7.

17	(a)	Explanation	C1	For stating the LCM of (4+7) and (5+3) is 88 **or** there is no smaller multiple of 8 and 11 (than 88)	
	(b)	23	P1	for using a scale factor appropriately eg 4×8 (=32) **or** 3×11 (=33) **or** 7×8 (=56) **or** 5×11 (=55) **or** for writing a pair of suitable fractions, eg $\frac{7}{11}$ and $\frac{3}{8}$ **or** $\frac{4}{11}$ and $\frac{5}{8}$ **or** $\frac{3}{8}$ and $\frac{4}{11}$	May be seen in a two-way table or probability tree
			P1	for finding the number of large cubes and red cubes **or** small and yellow **or** small and red eg 7×8 (=56) and 3×11 (=33) **or** 4×8 (=32) and 5×11 (=55) **or** 4×8 (=32) and 3×11 (=33) **OR** a suitable fractional equation, eg $\frac{7}{11}-x=\frac{3}{8}$ **or** $\frac{5}{8}-x=\frac{4}{11}$ **or** $x=1-\frac{3}{8}-\frac{4}{11}$ **OR** a suitable pair of probabilities with a common denominator, eg $\frac{56}{88}$ and $\frac{33}{88}$ **or** $\frac{32}{88}$ and $\frac{55}{88}$ **or** $\frac{33}{88}$ and $\frac{32}{88}$	May be seen in a two-way table or probability tree $\frac{23}{88}$ scores P2A0
			A1	cao	

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8.

22	21	P1	for a relevant probability, eg P(green) = $\frac{x}{2x+3}$ or P(blue) = $\frac{x+3}{2x+3}$	the number of green and blue pens could be $x-3$ and x or equivalent probabilities must be in an algebraic form in a single variable
		P1	for a relevant product, eg. " $\frac{x}{2x+3}$ "×" $\frac{x-1}{2x+2}$ " or " $\frac{x+3}{2x+3}$ " × " $\frac{x+2}{2x+2}$ " **OR** $\left(\text{"}\frac{x}{x+3}\text{"}\right)^2 + \left(\text{"}\frac{x+3}{2x+3}\text{"}\right)^2 = \frac{27}{75}$	This is an exception using replacements. No further credit is available
		P1	forms an appropriate equation, eg. " $\frac{x}{2x+3} \times \frac{x-1}{2x+2}$ " + " $\frac{x+3}{2x+3} \times \frac{x+2}{2x+2}$ " = $\frac{27}{55}$	
		P1	(dep P3) process to reduce equation to $ax^2 + bx + c = 0$ eg. $x^2 - 25x + 84 = 0$	
		P1	process to solve quadratic equation eg. $(x-21)(x-4) = 0$	
		A1	cao	

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9.

16	(a)	0.455	M1	for $0.65 \times (1 - 0.65)$ or 0.65×0.35 (=0.2275 or $\frac{91}{400}$) or 2×0.2275 oe	Could be shown on a tree diagram but must show an intention to multiply
			A1	oe	Acceptable equivalents are 45.5% or $\frac{91}{200}$ oe
	(b)	42	M1	for a start of the process eg $78 \div 0.65$ (= 120) or 78×0.35 (=27.3)	$\frac{78 \times 0.35}{0.65}$, $\frac{78}{0.65} - 78$
			A1	cao	

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10.

16	0.12	P1	for process to start eg $(1 - 0.2) \div (3 + 17)$ (= 0.04) **or** $(3 + 17) \div (1 - 0.2)$ oe (= 25) **or** $(100 - 20) \div (3 + 17)$ (= 4) **or** 3×4 (= 12) and 17×4 (= 68)	Just $1 - 0.2 = 0.8$ is **not** sufficient for P1 May be seen in a ratio
		P1	full process to find the required probability eg $3 \times$ "0.04" **or** $\frac{3}{20} \times (1 - 0.2)$ oe **or** $3 \div$ "25" or $3 \times$ "4" $\div 100$	
		A1	oe	0.12 using incorrect probability notation gets P2

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11.

8	$\frac{3}{22}$	P1 P1 P1 A1 SC B3 for $\frac{3}{60}$	for a process to find a first value eg male/Britain = 32 – 11 (=21) **or** Italy/total = 60 – (32+12) (=16) **or** female/total = 60 – 38 (=22) for process to find a secondary value, eg male/Spain = 38 – ("21" + 8) (=9) **or** female/Italy = "16" – 8 (=8) complete process to find female/Spain, eg 12 – "9" **or** "22" – (11 + "8") (=3) oe accept 0.136 to 0.14	<table><tr><td></td><td>Br</td><td>Sp</td><td>It</td><td>Tot</td></tr><tr><td>M</td><td>**21**</td><td>**9**</td><td>8</td><td>38</td></tr><tr><td>F</td><td>11</td><td>**3**</td><td>**8**</td><td>**22**</td></tr><tr><td>Tot</td><td>32</td><td>12</td><td>**16**</td><td>60</td></tr></table> May be seen in a frequency tree Values attributed to a category or from method seen

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12.

6 (a)	8	P1 P1 A1	for process to find sum of unknown probabilities, eg 1 – 0.45 – 0.25 (= 0.3) **OR** to find the total number of counters in the bag, eg $\frac{18}{0.45}$ (= 40) **OR** to find the number of yellow counters, eg $\frac{0.25}{0.45} \times 18$ (= 10) for process to find P(red) = 0.2 oe **or** P(white) = 0.1 oe **OR** for process to find the total number of red and white counters, eg "40" – 18 – "10" (=12) **OR** for process to derive an equation in x, eg $2x + x = 1 – 0.45 – 0.25$ or $2x + x =$ "0.3" or $x = 0.1$ for a complete process to find the number of red counters, eg $\frac{2 \times 0.1}{0.45} \times 18$ or $\frac{2}{3} \times$ "12" or $0.2 \times$ "40" or $\frac{0.2}{0.025}$ cao	Award mark for any two probabilities given that sum to 0.3 eg given in the table. Award P2 for P(red) or P(white) (could be shown in table) Equations could be given as written statements or working but must be fully equivalent.
(b)	Explanation	C1	for explanation eg 0.5 multiplied by an odd number will never be a whole number, for half of a number to be an integer that number must be even, you can't have half a marble	

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13.

20	$\frac{6}{490}$	P1 P1 P1 P1 A1	for start to process information, eg draws Venn diagram and shows at least 1 unknown amount, eg 5 speak German and Spanish but not French for process to find at least 3 unknown amounts from, eg 5 speak German and Spanish but not French 3 speak French and German but not Spanish 22 speak French but not German or Spanish 0 speak German but not French or Spanish for complete process to find number of people who speak only Spanish (= 6) for $\frac{\text{[number speaking Spanish only]}}{50} \times \frac{\text{[number speaking Spanish only]} - 1}{49}$, eg $\frac{6}{50} \times \frac{5}{49}$ for $\frac{6}{490}$ oe	See Venn Diagram at end of mark scheme – rectangle not needed Award first 3 marks to students who show this on the Venn diagram or in a statement. Award this mark for use of their number of students who speak Spanish. Must be a clear link, eg from Venn diagram See note 8 in general marking guidance but 0.01 or 1% must be from seen correct working.

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14.

4		$\frac{1}{11}$	P1	for starting the process, eg by writing down a correct ratio or using a given number of cubes for one relationship, eg 2B 1Y or B:Y = 2:1 or 4G 1B or G:B = 4:1 or 8G, 1Y or G:Y = 8:1 oe or yellow = 2, blue = 4, or states 2:1:8 oe in any order (can be algebraic)
			P1	for complete process to find possible number of each colour or equivalent ratio, eg 8G 2B 1Y or G:B:Y = 8:2:1 oe or yellow = 2, blue = 4, green = 16 oe (can be algebraic)
			A1	$\frac{1}{11}$ oe

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15.

15 (a)		No with reason	C1	for "no" with reason, eg Tracey should multiply 8 and 7
(b)		66	M1	for starting a method to find number of games played, eg 12 × 11 (= 132) or sum of integers from 1 to 11
			A1	cao

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16.

21 (a)		$\frac{1}{55}$	M1	for $\frac{4}{12} \times \frac{3}{11} \times \frac{2}{10}$
			A1	for $\frac{1}{55}$ oe
(b)		Conclusion (supported)	C1	starts correct argument, eg by calculating a relevant probability, eg $\frac{5}{15} \times \frac{4}{14} \times \frac{3}{13}$
			C1	statement of "more likely" from eg comparison of probabilities, ft answer to (a) eg $\frac{1}{55}$ (= 0.018…) and $\frac{2}{91}$ (= 0.021…or 0.022)

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17.

10 (a)		0.05	B1	for 0.05 oe
(b)		20	C1	for stating that at least 20 required
		Reason	C1	for reason eg explains that number of each colour must be a whole number or that there must be (at least) 1 red counter or shows that 0.05 = $\frac{1}{20}$

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18.

17		$\frac{28}{72}$	P1	for $\frac{6}{8}$ or $\frac{2}{8}$ or $\frac{7}{8}$ or $\frac{1}{8}$ oe seen on diagram or in a calculation
			P1	for $\frac{7}{9}\times\frac{2}{8}$ or $\frac{2}{9}\times\frac{7}{8}$ or $\frac{14}{72}$ oe for $\frac{7}{9}\times\frac{6}{8}$ or $\frac{2}{9}\times\frac{1}{8}$ or $\frac{42}{72}$ or $\frac{2}{72}$ or $\frac{44}{72}$ oe
			P1	for $\frac{7}{9}\times\frac{2}{8}+\frac{2}{9}\times\frac{7}{8}$ or "$\frac{14}{72}$" + "$\frac{14}{72}$" oe for $1-(\frac{7}{9}\times\frac{6}{8}+\frac{2}{9}\times\frac{1}{8})$ or $1-$("$\frac{42}{72}$" + "$\frac{2}{72}$") or $1-$"$\frac{44}{72}$" oe
			A1	oe SC B1 for $\frac{14}{81}$ B2 for $\frac{28}{81}$

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19.

1		98	P1 P1 A1 P1 P1 A1	for process to find P(1), eg. 1 – 0.17 – 0.18 – 0.09 – 0.15 – 0.1 (= 0.31) or for a process to find P(1 or 3), eg. 1 – 0.17 – 0.09 – 0.15 – 0.1 (= 0.49) for process to find the number of 3s eg. 0.18 × 200 (=36) or process to find the number of 1s, e.g. P(1) × 200 (= 62), or process to find the number of (1 or 3)s, eg [P(1) + 0.18] × 200 or for process to find any expected frequency using any probability × 200 eg. 0.17 × 200 cao OR for process to find P(2 or 4 or 5 or 6), eg. 0.17 + 0.09 + 0.15 + 0.1 (= 0.51) for process to find the number of (2 or 4 or 5 or 6)s, eg. "0.51" × 200 (= 102) cao

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20.

16		Events independent	C1	Statement that events are independent

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21.

22 (a)		chain of reasoning	C1	for a relevant product eg $\frac{y}{y+5}\times\frac{5}{y+4}$
			C1	for a correct equation eg $2\times\left(\frac{y}{y+5}\times\frac{5}{y+4}\right)=\frac{6}{11}$
			C1	for method to eliminate fractions from algebraic expression
			C1	complete chain of reasoning
(b)		$\frac{3}{11}$	M1	method to solve equation eg $(ax + b)(cx + d)$ with $ac = 3$ and $bd = \pm 60$
			A1	for selecting $y = 6$
			A1	for $\frac{3}{11}$ oe

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22.

3		0.22	P1 A1	begins process of subtraction of probabilities from 1 oe

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23.

6	(a)		Sharif	B1	Sharif with mention of greatest total throws
	(b)		No (supported)	P1 A1 P1	starts working with proportions Conclusion: correct for Paul, but not for the rest; or ref to just Paul's results selects Sharif or overall and multiplies P(heads)×P(heads) eg ¾ × ¾
	(c)	Tot: H 300 T 100	$\frac{9}{16}$	A1	oe

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24.

21		$\frac{10x-x^2}{45}$	P1 P1 P1 P1 A1	for $\frac{x}{10}$ or $\frac{10-x}{10}$ or $\frac{x-1}{9}$ or $\frac{10-x}{9}$ or $\frac{x}{9}$ or $\frac{9-x}{9}$ seen on diagram or in a calculation for $\frac{x}{10}\times\frac{10-x}{9}$ or $\frac{10-x}{10}\times\frac{x}{9}$ | for $\frac{x}{10}\times\frac{x-1}{9}+\frac{10-x}{10}\times\frac{9-x}{9}$ for $\frac{x}{10}\times\frac{10-x}{9}+\frac{10-x}{10}\times\frac{x}{9}$ | for $1-(\frac{x}{10}\times\frac{x-1}{9}+\frac{10-x}{10}\times\frac{9-x}{9})$ (dep on P3) for beginning to process the algebra $\frac{10x-x^2}{45}$ oe

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25.

18		0.49	P1 for $\sqrt{0.09}$ P1 for (1-"$\sqrt{0.09}$")² A1 cao

Pearson Edexcel - Sample Paper 1 - (Non-Calculator) Higher Tier

26.

24		25	P1 P1 P1 A1	For process to start to solve. Eg use of x and $4x$ or $x/5x$ and $4x/5x$ process to form equation eg $\frac{x}{5x}\times\frac{x-1}{5x-1}=\frac{6}{155}$ Processes to eliminate fractions and reduce equation to linear form eg. $155x - 155 = 150x - 30$

Pearson Edexcel - Sample Paper 3 - (Calculator) Higher Tier

27.

12	(a)	Draws correct Venn diagram	$\frac{44}{50}$	M1 Begin to interpret given information e.g. 3 overlapping labelled ovals with central region correct M1 Extend interpretation of given information e.g. 3 overlapping labelled ovals with at least 5 regions correct M1 Method to communicate given information e.g. 3 overlapping labelled ovals with all regions correct including outside A1 oe
	(b)		$\frac{21}{44}$	P1 For correct process to identify correct regions in Venn diagram and divide by '44' A1

Pearson Edexcel - Thursday 26 May 2016 - Paper 1 (Non-Calculator) Higher Tier

28.

6		90	3	M1 for $1-\frac{3}{5}$ $(=\frac{2}{5}$ or 40%) oe M1 for a complete method to find the number of female teachers (54) eg $36 \div 2 \times 3$ or determines $\frac{3}{5}$(60%) is 54, or 10% is 9 A1 cao **OR** M1 for F : M = 3 : 2 M1 for a complete method to find the number of female teachers (54) eg $\frac{3}{2} \times 36$ oe A1 cao

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29.

1	(a)		1 | 4 6 8 9 2 | 1 2 3 5 7 9 3 | 0 4 6 8 8 4 | 1 3 6 6 8	3	B2 for correct ordered stem and leaf (B1 for fully correct unordered, or ordered with one error or omission) B1 (indep) for key (units not required but must be correct if stated) eg. 1 | 4 = 14 (marks)
	(b)		$\frac{9}{20}$ oe	2	B2 for $\frac{9}{20}$ oe or ft from stem and leaf diagram (B1 for $\frac{x}{20}$ where $x < 20, x \neq 9$ or $\frac{9}{y}$ where $y > 9$ or ft from stem and leaf diagram)

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30.

5			0.09, 0.36	3	M1 for 1 – 0.4 – 0.15 oe (= 0.45) or 100 – 100×0.4 – 100×0.15 (= 45) M1 for (1 – 0.4 – 0.15) ÷ 5 (= 0.09) or (100 – 100×0.4 – 100×0.15) ÷ 5 (= 9) A1 for 0.09 and 0.36 oe OR M1 for $0.4 + 0.15 + x + 4x = 1$ M1 for $x = (1 – 0.4 – 0.15) \div 5$ A1 for 0.09 and 0.36 oe [SC: B1 for 0.162 and 0.648 if M0 scored]

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31.

4	(a)		60	2	M1 for 200 × 0.3 oe A1 cao
	(b)		0.1	2	M1 subtracting sum of probabilities from 1, e.g. 1−(0.3+0.2+0.4) A1 cao

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32.

25		$\frac{18}{30}\times\frac{12}{29}+\frac{7}{30}\times\frac{23}{29}+\frac{5}{30}\times\frac{25}{29}$ or $1-(\frac{18}{30}\times\frac{17}{29}+\frac{7}{30}\times\frac{6}{29}+\frac{5}{30}\times\frac{4}{29})$ or $\frac{18}{30}\times\frac{7}{29}+\frac{18}{30}\times\frac{5}{29}+\frac{7}{30}\times\frac{18}{29}+\frac{7}{30}\times\frac{5}{29}+\frac{5}{30}\times\frac{18}{29}+\frac{5}{30}\times\frac{7}{29}$	$\frac{502}{870}$	4	B1 for a second 'branch' probability seen (could be seen in a tree) M1 for a product of any first and second stage correct probabilities M1 for a complete method to find the required probability A1 for $\frac{502}{870}$ oe Note if decimals used they must be correct to 2 decimal places SC with replacement B2 for $\frac{502}{900}$ oe B0 M1 $\frac{18}{30}\times\frac{12}{30}$ or $\frac{7}{30}\times\frac{23}{30}$ or $\frac{5}{30}\times\frac{25}{30}$ M1 $\frac{18}{30}\times\frac{12}{30}+\frac{7}{30}\times\frac{23}{30}+\frac{5}{30}\times\frac{25}{30}$ A0

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33.

1	(a)		$\frac{1}{30}$	1	B1 for $\frac{1}{30}$ oe
	(b)		$\frac{3}{10}$	2	M1 for method to sum the number of white chocolates in the bag, eg 4 + 4 + 1 (= 9), A1 for $\frac{3}{10}$ or $\frac{9}{30}$ oe
	(c)		0.48	2	M1 for 1− (0.35 + 0.17) oe A1 for 0.48 oe

Pearson Edexcel - Wednesday 5 November 2014 - Paper 1 (Non-Calculator) Higher Tier

34.

23			$\frac{156}{336}$	4	**Method 1 (Combinations for odd T)** M1 for one probability for odd *T*, eg P(2,3,4) = $\frac{1}{8}\times\frac{2}{7}\times\frac{1}{6}$ or P(2,4,5) = $\frac{1}{8}\times\frac{1}{7}\times\frac{4}{6}$ or P(3,3,5) = $\frac{2}{8}\times\frac{1}{7}\times\frac{4}{6}$ or P(3,5,5) = $\frac{2}{8}\times\frac{4}{7}\times\frac{3}{6}$ or P(5,5,5) = $\frac{4}{8}\times\frac{3}{7}\times\frac{2}{6}$ M1 for adding at least two probabilities for odd *T*, eg $\frac{1}{8}\times\frac{2}{7}\times\frac{1}{6}+\frac{1}{8}\times\frac{1}{7}\times\frac{4}{6}$ or $3\left(\frac{2}{8}\times\frac{1}{7}\times\frac{4}{6}\right)$ M1 for completely correct method, ie $6\left(\frac{1}{8}\times\frac{2}{7}\times\frac{1}{6}\right)+6\left(\frac{1}{8}\times\frac{1}{7}\times\frac{4}{6}\right)+3\left(\frac{2}{8}\times\frac{1}{7}\times\frac{4}{6}\right)+3\left(\frac{2}{8}\times\frac{4}{7}\times\frac{3}{6}\right)+\left(\frac{4}{8}\times\frac{3}{7}\times\frac{2}{6}\right)$ oe A1 for $\frac{156}{336}$ oe, eg $\frac{13}{28}$ or 0.46(4…) **OR** **Method 2 (Combinations for even T)** M1 for one probability for even *T*, eg P(3,4,5) = $\frac{2}{8}\times\frac{1}{7}\times\frac{4}{6}$ or P(2,3,3) = $\frac{1}{8}\times\frac{2}{7}\times\frac{1}{6}$ or P(2,5,5) = $\frac{1}{8}\times\frac{4}{7}\times\frac{3}{6}$ or P(2,3,5) = $\frac{1}{8}\times\frac{2}{7}\times\frac{4}{6}$ or P(4,5,5) = $\frac{1}{8}\times\frac{4}{7}\times\frac{3}{6}$ or P(3,3,4) = $\frac{2}{8}\times\frac{1}{7}\times\frac{1}{6}$ M1 for adding at least two probabilities for even *T*, eg $\frac{2}{8}\times\frac{1}{7}\times\frac{4}{6}+\frac{1}{8}\times\frac{2}{7}\times\frac{1}{6}$ or $3\left(\frac{1}{8}\times\frac{2}{7}\times\frac{1}{6}\right)$ M1 for completely correct method, ie $1-[6\left(\frac{2}{8}\times\frac{1}{7}\times\frac{4}{6}\right)+3\left(\frac{1}{8}\times\frac{2}{7}\times\frac{1}{6}\right)+3\left(\frac{1}{8}\times\frac{4}{7}\times\frac{3}{6}\right)+6\left(\frac{1}{8}\times\frac{2}{7}\times\frac{4}{6}\right)+3\left(\frac{1}{8}\times\frac{4}{7}\times\frac{3}{6}\right)+3\left(\frac{2}{8}\times\frac{1}{7}\times\frac{1}{6}\right)$ oe A1 for $\frac{156}{336}$ oe, eg $\frac{13}{28}$ or 0.46(4…) **PTO**

					Method 3 (Combinations of odd and even numbers- odd totals) M1 for one probability for odd T, eg P(E,E,O) =. $\frac{2}{8}\times\frac{1}{7}\times\frac{6}{6}$ or P(O,O,O) = $\frac{6}{8}\times\frac{5}{7}\times\frac{4}{6}$ M1for adding at least two probabilities for odd *T*, eg $3\left(\frac{2}{8}\times\frac{1}{7}\times\frac{6}{6}\right)$ or $\left(\frac{2}{8}\times\frac{1}{7}\times\frac{6}{6}\right)+\left(\frac{6}{8}\times\frac{5}{7}\times\frac{4}{6}\right)$ M1 for completely correct method, ie $3\left(\frac{2}{8}\times\frac{1}{7}\times\frac{6}{6}\right)+\left(\frac{6}{8}\times\frac{5}{7}\times\frac{4}{6}\right)$ A1 for $\frac{156}{336}$ oe, eg $\frac{13}{28}$ or 0.46(4…) **OR** **Method 4 (combinations of odd and even numbers- even totals)** M1 for probability for even T, ie = $\frac{2}{8}\times\frac{6}{7}\times\frac{5}{6}$ M1 for adding at least two probabilities for even *T*, eg $3\left(\frac{2}{8}\times\frac{6}{7}\times\frac{5}{6}\right)$ M1 for completely correct method, ie $1-3\left(\frac{2}{8}\times\frac{6}{7}\times\frac{5}{6}\right)$ A1 for $\frac{156}{336}$ oe, eg $\frac{13}{28}$ or 0.46(4…) **SC (with replacement)** For example, M0 M1 for adding at least two probabilities for odd or even *T*, eg P(E,E,O) = $\frac{2}{8}\times\frac{2}{8}\times\frac{6}{8}$ or P(O,O,O) = $\frac{6}{8}\times\frac{6}{8}\times\frac{6}{8}$ M1 for completely correct method, eg $3\left(\frac{2}{8}\times\frac{2}{8}\times\frac{6}{8}\right)+\left(\frac{6}{8}\times\frac{6}{8}\times\frac{6}{8}\right)$ or $\frac{288}{512}$ oe, eg $\frac{9}{16}$ or 0.56(25) A0

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35.

5	(a)		0.2	2	M1 for 1 – 0.16 – 0.4 – 0.24 oe A1 cao
	(b)		20	2	M1 for 0.16 × 125 oe A1 cao

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36.

*22			Yes	3	M1 for 1 – 0.6 (=0.4) M1 for ("0.4")³ oe C1 (dep on M1) for 0.064 oe leading to a correct deduction OR M1 for 1−Pr(3H, 0T) − Pr(2H, 1T) − Pr(1H, 2T) oe M1 for 1−(0.6)³−3(0.6)²(0.4)−3(0.6)(0.4)² C1 (dep on M1) for 0.064 oe leading to a correct deduction

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37.

5	(a)		0.25	1	B1 oe
	(b)		150	2	M1 for 0.75 × 200 oe A1 cao

Pearson Edexcel - Wednesday 6 November 2013 - Paper 1 (Non-Calculator) Higher Tier

38.

19			0.82	3	M1 for 1 – 0.7 (= 0.3) or 1 – 0.4 (= 0.6) M1for 1– '0.3'×'0.6' A1 for 0.82 oe OR M1 for 1 – 0.7 (= 0.3) or 1 – 0.4 (= 0.6) M1 (0.7 × 0.4) + (0.7 × '0.6') + ('0.3'× 0.4) A1 for 0.82 oe

Pearson Edexcel - Friday 8 November 2013 - Paper 2 (Calculator) Higher Tier

39.

3		4	2	M1 for 14 **or** $\frac{3+7}{n}=\frac{5}{7}$ **or** any fraction equivalent to $\frac{2}{7}$ or $\frac{5}{7}$ A1 cao

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40.

26		50 1 1 1 50 1 1 1 50	$\frac{126}{720}$	4	M1 for 3 fractions $\frac{a}{10}$, $\frac{b}{9}$, $\frac{c}{8}$ where a < 10, b < 9 and c < 8 M1 for $\frac{7}{10}\times\frac{3}{9}\times\frac{2}{8}$ or $\frac{3}{10}\times\frac{7}{9}\times\frac{2}{8}$ or $\frac{3}{10}\times\frac{2}{9}\times\frac{7}{8}$ $(=\frac{42}{720})$ M1 for $\frac{7}{10}\times\frac{3}{9}\times\frac{2}{8}+\frac{3}{10}\times\frac{7}{9}\times\frac{2}{8}+\frac{3}{10}\times\frac{2}{9}\times\frac{7}{8}$ or $3\times\frac{3}{10}\times\frac{2}{9}\times\frac{7}{8}$ A1 for $\frac{126}{720}$ oe. eg. $\frac{7}{40}$ **Alternative Scheme for With Replacement** M1 for $\frac{7}{10}\times\frac{3}{10}\times\frac{3}{10}$ $(=\frac{63}{1000})$ M1 for $\frac{7}{10}\times\frac{3}{10}\times\frac{3}{10}\times 3$ $(=\frac{189}{1000})$ M0 A0 No further marks

Pearson Edexcel - Friday 14 June 2013 - Paper 2 (Calculator) Higher Tier

41.

4			126	3	M1 for 1 – 0.05 – 0.32 (= 0.63) M1 for '0.63' × 200 A1 cao OR M1 for 0.05 × 200 (= 10) or 0.32 × 200 (= 64) or 0.37 × 200 (=74) M1 for 200 – '10' – '64' A1 cao OR M1 for 100 – 5 – 32 (= 63) M1 for $\frac{"63"}{100}\times 200$ A1 cao SC: B2 for $\frac{126}{200}$ as the answer.

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42.

24		EE + CC + HH	$\frac{76}{110}$	5	M1 for use of 10 as denominator for 2nd probability M1 for $\frac{4}{11}\times\frac{3}{10}$ *or* $\frac{5}{11}\times\frac{4}{10}$ *or* $\frac{2}{11}\times\frac{1}{10}$ M1 for $\frac{4}{11}\times\frac{3}{10}+\frac{5}{11}\times\frac{4}{10}+\frac{2}{11}\times\frac{1}{10}\left(=\frac{34}{110}\right)$ M1 (dep on previous M1 for $1-$ '$\frac{34}{110}$' A1 for $\frac{76}{110}$ oe **Or** M1 for use of 10 as denominator for 2nd probability M1 for $\frac{4}{11}\times\frac{5}{10}$ or $\frac{4}{11}\times\frac{2}{10}$ or $\frac{5}{11}\times\frac{4}{10}$ or $\frac{5}{11}\times\frac{2}{10}$ or $\frac{2}{11}\times\frac{4}{10}$ or $\frac{2}{11}\times\frac{5}{10}$ M2 for $\frac{4}{11}\times\frac{5}{10}+\frac{4}{11}\times\frac{2}{10}+\frac{5}{11}\times\frac{4}{10}+\frac{5}{11}\times\frac{2}{10}+\frac{2}{11}\times\frac{4}{10}+\frac{2}{11}\times\frac{5}{10}$ (M1 for at least 3 of these) A1 for $\frac{76}{110}$ oe **Or** M1 for use of 10 as denominator for 2nd probability M1 for $\frac{4}{11}\times\frac{7}{10}$ *or* $\frac{5}{11}\times\frac{6}{10}$ *or* $\frac{2}{11}\times\frac{9}{10}$ M2 for $\frac{4}{11}\times\frac{7}{10}+\frac{5}{11}\times\frac{6}{10}+\frac{2}{11}\times\frac{9}{10}$ (M1 for two of these added) A1 for $\frac{76}{110}$ oe **PTO for SC's**
		Or EC+EH+CE+CH+HE+HC			
		Or E,not E+ C,not C + H,not H			
					SC: B2 for $\frac{76}{121}$ **SC:** B1 for $\frac{4}{11}\times\frac{4}{11}+\frac{5}{11}\times\frac{5}{11}+\frac{2}{11}\times\frac{2}{11}\left(=\frac{45}{121}\right)$ **Or** $\frac{4}{11}\times\frac{5}{11}+\frac{4}{11}\times\frac{2}{11}+\frac{5}{11}\times\frac{4}{11}+\frac{5}{11}\times\frac{2}{11}+\frac{2}{11}\times\frac{4}{11}+\frac{2}{11}\times\frac{5}{11}$ **Or** $\frac{4}{11}\times\frac{7}{11}+\frac{5}{11}\times\frac{6}{11}+\frac{2}{11}\times\frac{9}{11}$

Pearson Edexcel - Monday 4 March 2013 - Paper 2 (Calculator) Higher Tier

43.

4	(a)	$1-0.2-0.1$ $0.7\div 2$	0.35	3	M1 for correctly using total probability is 1 or 100% if percentages used M1 (dep) for complete correct method to complete the solution A1 for 0.35 or 35% or $\frac{35}{100}$oe
	(b)		20	2	M1 for 0.1×200 oe A1 cao SC : If M0 then award B1 for an answer of $\frac{20}{200}$

Pearson Edexcel - Tuesday 6 November 2012 - Paper 1 (Non-Calculator) Higher Tier

44.

8	(a)		0.15	2	M1 for $1-(0.2+0.5)$ oe or sight of 0.3 A1 oe
	(b)		48	2	M1 for 240×0.2 oe or $48+120+36+36$ A1 cao

Pearson Edexcel - Thursday 8 November 2012 - Paper 2 (Calculator) Higher Tier

45.

21	(a)	$\frac{2}{7}\times\frac{1}{6}$ **OR** **1 1 2 2 2 3 3** **1** X √ **1** √ X **2** X **2** X **2** X **3** X **3** X	$\frac{2}{42}$	2	M1 $\frac{2}{7}\times\frac{1}{6}$ A1 $\frac{2}{42}$ oe **OR** M1 Fully correct sample space with the correct cases identified A1 $\frac{2}{42}$ oe SC : B1 for an answer of $\frac{4}{49}$
21	(b)	$\frac{2}{7}\times\frac{5}{6}+\frac{3}{7}\times\frac{2}{6}$ **OR** **1 1 2 2 2 3 3** **1** X √ √ √ √ √ **1** X √ √ √ √ √ **2** X √ √ **2** X √ √ **2** X √ √ **3** X **3** X	$\frac{16}{42}$	3	M1 for identifying all 3 possibilities of (1,2) and (1,3) and (2,3) **OR** at least one of $\frac{2}{7}\times\frac{3}{6}(1,2)$ **or** $\frac{2}{7}\times\frac{2}{6}(1,3)$ **or** $\frac{3}{7}\times\frac{2}{6}(2,3)$ **or** $\frac{2}{7}\times\frac{5}{6}(1,2 \text{ or } 3)$ M1 $\frac{2}{7}\times\frac{5}{6}+\frac{3}{7}\times\frac{2}{6}$ **or** $\frac{2}{7}\times\frac{3}{6}+\frac{2}{7}\times\frac{2}{6}+\frac{3}{7}\times\frac{2}{6}$ A1 $\frac{16}{42}$ oe **OR** M2 Fully correct sample space with the correct cases identified (M1 for 1,2 and 1,3 and 2,3 identified on a sample space) A1 $\frac{16}{42}$ oe SC: B2 for an answer of $\frac{16}{49}$

Pearson Edexcel - Wednesday 13 June 2012 - Paper 2 (Calculator) Higher Tier

46.

12		0.3 × 400	120	2	M1 for 0.3 × 400 oe A1 cao

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47.

25		$\frac{12}{20}\times\frac{11}{19}+\frac{5}{20}\times\frac{4}{19}+\frac{3}{20}\times\frac{2}{19}$ $1-\left(\frac{12}{20}\times\frac{11}{19}+\frac{5}{20}\times\frac{4}{19}+\frac{3}{20}\times\frac{2}{19}\right)$	$\frac{222}{380}$	4	B1 for $\frac{12}{19}$ or $\frac{5}{19}$ or $\frac{3}{19}$ (could be seen in working or on a tree diagram) M1 for $\frac{12}{20}\times\frac{5}{19}$ *or* $\frac{12}{20}\times\frac{3}{19}$ *or* $\frac{5}{20}\times\frac{12}{19}$ *or* $\frac{5}{20}\times\frac{3}{19}$ *or* $\frac{3}{20}\times\frac{12}{19}$ *or* $\frac{3}{20}\times\frac{5}{19}$ M1 for $\frac{12}{20}\times\frac{5}{19}+\frac{12}{20}\times\frac{3}{19}+\frac{5}{20}\times\frac{12}{19}+\frac{5}{20}\times\frac{3}{19}+\frac{3}{20}\times\frac{12}{19}+\frac{3}{20}\times\frac{5}{19}$ A1 for $\frac{222}{380}$ oe or 0.58(421...) **OR** B1 for $\frac{8}{19}$ or $\frac{15}{19}$ or $\frac{17}{19}$ M1 for $\frac{12}{20}\times\frac{8}{19}$ *or* $\frac{5}{20}\times\frac{15}{19}$ *or* $\frac{3}{20}\times\frac{17}{19}$ M1 for $\frac{12}{20}\times\frac{8}{19}+\frac{5}{20}\times\frac{15}{19}+\frac{3}{20}\times\frac{17}{19}$ A1 for $\frac{222}{380}$ oe or 0.58(421...) **OR** (continued overleaf…)
25 contd					B1 for $\frac{11}{19}$ or $\frac{4}{19}$ or $\frac{2}{19}$ M1 for $\frac{12}{20}\times\frac{11}{19}$ *or* $\frac{5}{20}\times\frac{4}{19}$ *or* $\frac{3}{20}\times\frac{2}{19}$ M1 for $1-\left(\frac{12}{20}\times\frac{11}{19}+\frac{5}{20}\times\frac{4}{19}+\frac{3}{20}\times\frac{2}{19}\right)$ A1 for $\frac{222}{380}$ oe or 0.58(421...) **NB** if decimals used they must be correct to at least 2 decimal places **SC : with replacement** B2 for $\frac{111}{200}$ oe **OR** e.g. B0 M1 for $\frac{12}{20}\times\frac{8}{20}$ *or* $\frac{5}{20}\times\frac{15}{20}$ *or* $\frac{3}{20}\times\frac{17}{20}$ M1 for $\frac{12}{20}\times\frac{8}{20}+\frac{5}{20}\times\frac{15}{20}+\frac{3}{20}\times\frac{17}{20}$ A0

Pearson Edexcel - Friday 2 March 2012 - Paper 3 (Non-Calculator) Higher Tier

48.

5	(a)		$\frac{7}{12}$	2	M1 for $\frac{6+1}{5+6+1}$ or $1-\frac{5}{12}$ **or** $\frac{7}{n}$ where $n > 7$ **or** $\frac{k}{12}$ where $k < 12$ A1 for $\frac{7}{12}$ oe eg. 0.58(33…) SC : Award B1 for 7 : 12 **or** 7 out of 12 **or** 7 in 12 oe
	(b)	$\frac{1}{3}=\frac{5}{15}$ or 1: 3 = 5:15 15 – 5 – 6 = 4 **OR** $\frac{x+12}{5}=3, x=3, 3+1$	4	2	M1 $\frac{1}{3}=\frac{5}{15}$ **or** 15 seen **or** 3 more green A1 cao **OR** M1 $\frac{x+12}{5}=3$ A1 cao SC : Award B1 for an answer of $\frac{4}{15}$

Pearson Edexcel - Monday 5 March 2012 - Paper 4 (Calculator) Higher Tier

49.

9	(a)	1 – (0.15 + 0.25 + 0.20 + 0.16)	0.24	2	M1 for 1 – (0.15 + 0.25 + 0.20 + 0.16) or 1 – "0.76" A1 for 0.24 oe
	(b)	300 × 0.25	75	2	M1 for 300 × 0.25 A1 cao

Pearson Edexcel - Friday 10 June 2011 - Paper 4 (Calculator) Higher Tier

50.

1	(a)	1 – (0.2 + 0.1 + 0.5) = 1 – 0.8	0.2	2	M1 for 1 – (0.2 + 0.1 + 0.5) oe A1 for 0.2 oe
	(b)	800 × 0.2	160	2	M1 for 800 × 0.2 oe A1 cao

Pearson Edexcel - Friday 10 June 2011 - Paper 4 (Calculator) Higher Tier

51.

24		$(\frac{5}{10}\times\frac{4}{9})+(\frac{3}{10}\times\frac{2}{9})+(\frac{2}{10}\times\frac{1}{9})$ $=\frac{20+6+2}{90}$	$\frac{28}{90}$	4	B1 for $\frac{4}{9}$ or $\frac{2}{9}$ or $\frac{1}{9}$ seen as 2nd probability M1 for $(\frac{5}{10}\times\frac{4}{9})$ or $(\frac{3}{10}\times\frac{2}{9})$ or $(\frac{2}{10}\times\frac{1}{9})$ M1 for $(\frac{5}{10}\times\frac{4}{9})+(\frac{3}{10}\times\frac{2}{9})+(\frac{2}{10}\times\frac{1}{9})$ A1 for $\frac{28}{90}$ oe SC Sample Space . B4 for $\frac{28}{90}$ Otherwise B0 Alternative scheme for replacement B0 for 2nd probability with denominator 10 M1 for $(\frac{5}{10}\times\frac{5}{10})$ or $(\frac{3}{10}\times\frac{3}{10})$ or $(\frac{2}{10}\times\frac{2}{10})$ M1 for $(\frac{5}{10}\times\frac{5}{10})+(\frac{3}{10}\times\frac{3}{10})+(\frac{2}{10}\times\frac{2}{10})$ A0 S.C. If M0 scored, award B2 for $\frac{38}{100}$ oe

Pearson Edexcel - Tuesday 9 November 2010 - Paper 3 (Non-Calculator) Higher Tier

52.

3	(a)		13 15 15 17	1	B1 cao
	(b)		(4, 7), (6, 5), (8, 3)	2	B2 for all 3 pairs (numbers in any order in each pair, condone use of addition sign) and no extra pairs (B1 for one or two or three correct pairs and no more than three extra pairs given, ignoring repeats)
	(c)		$\frac{3}{20}$ oe	2	B2 ft accept answer as fraction or decimal or percentage (B1 for $\frac{x}{20}$, $x < 20$, $x \neq 3$ or $\frac{3}{x}$, $x > 3$, $x \neq 3$) SC: If no marks scored award B1 for '3 out of 20' as final answer **or** other use of incorrect notation

Pearson Edexcel - Friday 12 November 2010 - Paper 4 (Calculator) Higher Tier

53.

2	$1 - 0.58 - 0.3$ $= 1 - 0.88$	0.12	2	M1 for $1 - 0.58 - 0.3$ oe A1 for 0.12 oe

Pearson Edexcel - Friday 12 November 2010 - Paper 4 (Calculator) Higher Tier

54.

26	$\frac{7}{11}\times\frac{4}{10}+\frac{4}{11}\times\frac{7}{10}$ $=\frac{28}{55}+\frac{28}{55}$	$\frac{28}{55}$	3	M1 for $\frac{4}{10}$ and $\frac{7}{10}$ as second probabilities, may be seen on a tree diagram, or for $\frac{7}{11}\times\frac{4}{10}$ or $\frac{4}{11}\times\frac{7}{10}$ M1 (dep) for $\frac{7}{11}\times\frac{"4"}{10}+\frac{4}{11}\times\frac{"7"}{10}$ A1 for $\frac{28}{55}$ oe SC B2 for an answer of $\frac{56}{121}$ oe

Pearson Edexcel - Monday 7 June 2010 - Paper 3 (Non-Calculator) Higher Tier

55.

26	$\left(\frac{3}{10}\times\frac{2}{9}\right)+\left(\frac{2}{10}\times\frac{1}{9}\right)+\left(\frac{5}{10}\times\frac{4}{9}\right)=\frac{6+2+20}{90}$	$\frac{28}{90}$ oe	4	B1 for $\frac{2}{9}$ (orange) or $\frac{1}{9}$ (red) or $\frac{4}{9}$ (yellow) seen as 2nd probability M1 for $\left(\frac{3}{10}\times\frac{2}{9}\right)$ or $\left(\frac{2}{10}\times\frac{1}{9}\right)$ or $\left(\frac{5}{10}\times\frac{4}{9}\right)$ M1 for $\left(\frac{3}{10}\times\frac{2}{9}\right)+\left(\frac{2}{10}\times\frac{1}{9}\right)+\left(\frac{5}{10}\times\frac{4}{9}\right)$ A1 for $\frac{28}{90}$ oe **Alternative scheme for replacement** M1 for $\left(\frac{3}{10}\times\frac{3}{10}\right)$ or $\left(\frac{2}{10}\times\frac{2}{10}\right)$ or $\left(\frac{5}{10}\times\frac{5}{10}\right)$ M1 for $\left(\frac{3}{10}\times\frac{3}{10}\right)+\left(\frac{2}{10}\times\frac{2}{10}\right)+\left(\frac{5}{10}\times\frac{5}{10}\right)$ No further marks may be awarded

Pearson Edexcel - Friday 11 June 2010 - Paper 4 (Calculator) Higher Tier

56.

10	(a)	$1-(0.15+0.3+0.35)=$	0.20	2	M1 for $1-(0.15+0.3+0.35)$ A1 for 0.2 oe
	(b)	0.30×500	150	2	M1 for 0.30×500 A1 cao NB: $\frac{150}{500}$ etc. gets M1 A0 but "150 out of 500" gets M1 A1

OCR GSCE – Thursday 5 November 2020 – Paper 5 (Non-Calculator) Higher Tier

57.

4	(a)		Correctly completes table 7 6 7	1		
4	(b)	(i)	$\frac{13}{25}$ **oe**	2	**B1FT** for *their* correct numerator **B1** for fraction with denominator 25	In (b)(i) and (ii), not ratio or words, eg $\frac{13}{25}$, likely but not $\frac{13}{25}$, unlikely isw cancelling/conversion to other forms FT numerator 12 + any evens in *their* (a)
4	(b)	(ii)	$\frac{14}{25}$ **oe**	2	**FT** *their* correct numerator / 25 **B1FT** for *their* correct numerator but denominator incorrect	FT numerator 13 + any multiples of 3 or 4 in *their* (a)

OCR GSCE – Monday 9 November 2020 – Paper 6 (Calculator) Higher Tier

58.

8			31 nfww	4	**M2** for 20 : 10 or $\frac{20}{30}$ and 21 : 9 or $\frac{21}{30}$ and **SC1** for final answer 30 dep on **M2** OR **M1** for at least one other fraction equivalent to $\frac{2}{3}$ seen, or one other fraction equivalent to $\frac{7}{10}$ seen <u>Alternative method using algebra</u> **M1** for $\frac{r-1}{t-1}=\frac{2}{3}$ oe or $\frac{r}{t-1}=\frac{7}{10}$ oe **M1** for $3(r-1)=2(t-1)$ and $10r=7(t-1)$ or better **M1** for elimination or substitution of *r* If **0** scored **SC1** for answer 30 with no working	<u>Notes on alternative method</u> Where number of red = *r*. Does not need to be defined. Accept any other letter. Implies first **M1** mark A correct equation in *b* may imply first **M1M1** marks

OCR GSCE – Monday 9 November 2020 – Paper 6 (Calculator) Higher Tier

59.

12			$\frac{4}{28}$ oe or 0.1428 to 0.143	3	**M1** for 4 correct combinations soi by highlighting in list or table or by unsimplified numerator 4 **M1** for 4 × 7 soi by complete list or table or by 28 <u>Alternative method</u> **M2** for $\left(\frac{1}{4}\times\frac{1}{7}\right)+\left(\frac{1}{4}\times\frac{2}{7}\right)+\left(\frac{1}{4}\times\frac{1}{7}\right)$ oe or **M1** for $\frac{1}{4}\times\frac{1}{7}$ or $\frac{1}{4}\times\frac{2}{7}$ oe seen	Economics Engineering Geography German Geography Graphics Media Music

OCR GSCE – Monday 9 November 2020 – Paper 6 (Calculator) Higher Tier

60.

15			$\frac{9}{16}$ or [0].5625 oe	**4**	**B1** for 0.75 oe seen **M2** for 0.25 × 0.3 + *their* 0.75 × 0.65 or **M1** for 0.25 × 0.3 soi by 0.075 or $\frac{3}{40}$ oe or for *their* 0.75 × 0.65 soi by 0.4875 or $\frac{39}{80}$ oe	Accept [0].56 or [0].563 as final answer for full marks if **B1M2** earned Award **B** and **M** marks for equivalent working with a base value e.g. 100 buses

OCR GSCE – Thursday 7 November 2019 – Paper 5 (Non-Calculator) Higher Tier

61.

11			Select a pencil from the bag and record results **and** put it back in the bag **oe**	**1**		Steps may be combined together
			Repeat trial at least 10 times	**1**		Accept many, a lot etc clearly implied
			Find rel frequency or probability	**1**	eg $\frac{\text{no of red pencils}}{\text{no of trials}}$ **oe** or no of red pencils recorded **and** no of trials recorded or number of greens recorded **oe**	oe eg if number of trials = 20 and then number of reds × 5 or no of red pencils × $\frac{100}{\text{no of trials}}$ oe then allow both marks
			Rel freq × 100 **oe**	**1**		

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62.

16			$\frac{11}{40}$ **oe**	**5**	**B3** for walk [only] = 29, walk and sail = 11 or **B2** for walk and sail = 11 or **M1** for 40 + 18 + 3 – 50 **oe** **M1** for answer $\frac{n}{40}$ or $\frac{11}{k}$ **OR** **M1** for 40 + 18 + 3 – 50 **oe** **B2FT** for correctly completed Venn diagram with 40 – *x*, *x* [*their* 11], 18 – *x*, [3] correctly placed FT *their x* (can be algebraic or *x* is an integer (0 < *x* < 18) or **B1FT** for attempt at Venn diagram with 40 – *x* or 18– *x* or 3 correctly placed FT *their x* (can be algebraic or *x* is an integer 0 < *x* < 18) **M1** for answer $\frac{n}{40}$ or $\frac{11}{k}$	Accept dec or % equivalents (3 figures) 0.275 or 27.5 % isw cancelling, conversion to other forms For B3 and B2 11 must be identified for both walk and sail M1 implied by 11 seen where 0 < *n* < 40 and 11 < *k* < 50 Check previous working for signs of cancelling e.g. $\frac{18}{40}=\frac{9}{20}$ gets M1 M1 implied by 11 seen For B2 or B1, condone omission of universal set rectangle where 0 < *n* < 40 and 11 < *k* < 50 Check previous working for signs of cancelling e.g. $\frac{18}{40}=\frac{9}{20}$ gets M1

OCR GSCE – Monday 11 November 2019 – Paper 6 (Calculator) Higher Tier

63.

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* $\left(\frac{2}{6}\right) < 1$

OCR GSCE – Monday 11 November 2019 – Paper 6 (Calculator) Higher Tier

64.

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 $\frac{2}{3}\times$ *their* $\frac{n}{44}$ or $\frac{2}{3}\times\frac{29}{45}$	oe e.g. $\frac{870}{1980}$ or 0.439… or 0.44 after correct working

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65.

6			[Year 10] [left]17 and [total] 61 [Year 11] [left] 20 and [total] 59 **and** a comparison such as there are more Year 11 left-handers [than Y10] and there are fewer Year 11s [than Y10] in total or two comparable figures e.g. $[\frac{17}{61}=]$ .28 or .279 or .27[8…] or 28% or $\frac{1003}{3599}$ oe $[\frac{20}{59}=]$ .34 or .339 or .33[8…] or 34% or $\frac{1220}{3599}$ oe **and** conclusion e.g. Y11	**6**	**B5** for [Year 10] 17 with 61, and [Year 11] 20 with 59 (eg as fractions, or "out of") and **B1** for a comparison and conclusion e.g. two comparable figures or a statement such as "there are more Year 11 left-handers [than Y10] and there are fewer Year 11s [than Y10] in total ……." or the following marks may be seen in their working or in the table **B4** for [Year 10] 17 with 61 **and** [Year 11] 20 with 59 or **B3** for [Year 10] 17 with 61 **or** [Year 11] 20 with 59 or **B2** for 17 or both 37 and 59 or **B1** for 37 or 59 if percentages used we must see % sign or use "out of 100 people …"

OCR GSCE – Thursday 6 June 2019 – Paper 5 (Non-Calculator) Higher Tier

66.

18			$\frac{12}{132}$ **oe**	**6**	**M5** for $\frac{4}{12} \times \frac{3}{11}$ or **B4** for $\frac{4}{12}$ **seen** or **B3** for train [only] = 8, train and car = 4 or **B2** for train and car = 4 or **M1** for 12 + 6 + 7 – 21 **oe** **OR** **B2FT** for correctly completed Venn diagram with 12 – *x*, *x* [*their* 4], 6 – *x*, 7 correctly placed FT *their x* (can be algebraic or *x* is an integer $0 < x \leq 14$) or **B1FT** for attempt at Venn diagram with 12 – *x* or 6– *x* or 7 correctly placed FT *their x* (can be algebraic or *x* is an integer $0 < x \leq 14$) **M1** for $\frac{k}{n} \times \frac{k-1}{n-1}$ If 0 scored, **SC1** for $\frac{k}{n} \times \frac{k}{n}$ **soi**	Accept dec or % equivalents (3 figures) 0.0909… or 9.09… % isw cancelling, conversion to other forms Do not accept $\frac{2}{6}$ alone For B4 accept $\frac{1}{3}$ provided it does not come from $\frac{2}{6}$ alone For B2 and B1, condone no rectangle around Venn diagram where $k < n$ and $n < 21$ where $k < n$ and $n < 21$

OCR GSCE – Tuesday 11 June 2019 – Paper 6 (Calculator) Higher Tier

67.

3	**a**		Correct answer based on angle or area/arc length	**1**	The angle [for black] • is too small oe or • is less than a fifth oe or • should be 72 oe The area/arc length [for black] • is too small oe or • is less than a fifth oe	Accept 26 to 30 for "the angle" Accept "not equal to" for "too small" or "less than" See appendix
	b		Any comment recognising limitations in range of the vertical scale	**1**		EG It does not start at zero or It starts at 113 See appendix

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68.

4			[expected profit is £] 80 with 200 and 120 seen	**4**	**B1** for [£] 200 or 20 000[p] AND **M2** for 0.1 × 400 × 3 soi 120 or **M1** for 0.1 × 400 soi 40 <u>Alternative method</u> **B1** for [£] 200 or 20 000[p] **M1** for $\frac{their200-100}{3}$ [prizes] soi 33[.3…] **M1** for 0.1 × 400 soi 40 **A1** for she is giving away too many prizes oe <u>Alternative method</u> **B1** for [£] 200 or 20 000[p] **M1** for $\frac{their200-100}{3}$ [prizes] soi 33[.3…] **M1** for $\frac{their\ 33[.3...]}{400}$ soi 0.08[3…] **A1** for the probability of winning the game is too great oe	Apply scheme to consistent working in pence rather than £.

OCR GSCE – Tuesday 11 June 2019 – Paper 6 (Calculator) Higher Tier

69.

12	**a**		<table><tr><td>(0)</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr><tr><td>1</td><td>0</td><td>1</td><td>2</td><td>(3)</td><td>4</td></tr><tr><td>2</td><td>(1)</td><td>0</td><td>1</td><td>2</td><td>3</td></tr><tr><td>3</td><td>2</td><td>1</td><td>0</td><td>1</td><td>2</td></tr><tr><td>4</td><td>(3)</td><td>2</td><td>1</td><td>0</td><td>1</td></tr><tr><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr></table>	**2**	**B1** for at least 10 correct entries	
	b		$\frac{125}{5832}$	**4**	**B3** for $\frac{1000}{46656}$ oe isw wrong cancelling or for 0.0214(33…) oe as final answer OR **B1FT** for $\frac{10}{36}$ oe and **M1** for $their\frac{10}{36} \times their\frac{10}{36} \times their\frac{10}{36}$	**FT** from their completed table in part **(a)** $\frac{10}{36}=\frac{5}{18}$ = 0.2777… to 0.278 Common mistake: **B1 M0** for $3 \times \frac{10}{36}$

OCR GSCE – Thursday 8 November 2018 – Paper 5 (Non-Calculator) Higher Tier

70.

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

OCR GSCE – Thursday 7 June 2018 – Paper 5 (Non - Calculator) Higher Tier

71.

8	(a)		Too many branches **oe**	1		Accept e.g. Takes too long oe Tree would be too big oe Too complicated oe Too hard to draw oe Tree diagrams are better for fewer outcomes oe Do not accept e.g. Trees can only have two branches

	(b)	(i)	Attempts sample space 36 correct outcomes	M1 A1	Presented in any clear form, including list or table Pairs shown or accept as totals in table	For M1, accept two by two table drawn with row and column labelled 1 to 6 [with no entries or with incorrect entries] For M1 accept as a list of at least 6 different pairs or totals with no others or no repeats If listing as pairs on table, condone e.g. (2, 1) listed as (1, 2) etc
		(ii)	$\frac{2}{36}=\frac{1}{18}$	2	**M1** for (5, 6) and (6, 5) identified or for $2\left(\frac{1}{6}\times\frac{1}{6}\right)$ **oe**	Accept indicated on sample space

OCR GSCE – Tuesday 6 November 2017 – Paper 5 (Non - Calculator) Higher Tier

72.

14	(a)		It should have been $\frac{5}{10}\times\frac{4}{9}$ **oe isw**	2	**M1** for showing $\frac{5}{10}\times\frac{5}{10}$ or $\frac{1}{2}\times\frac{1}{2}$ or for explaining that he did not take account that there was one less sweet for the second choice **oe**	
	(b)		$\frac{58}{90}$ **oe**	4	**M3** for $\left(\frac{5}{10}\times\frac{5}{9}\right)+\left(\frac{4}{10}\times\frac{6}{9}\right)+\left(\frac{1}{10}\times\left[\frac{9}{9}\right]\right)$ **oe** or **M2** for the sum of any 2 of the above products **oe isw** or **M1** for any correct product from above **oe isw** If 0 scored, **SC1** for 58 different options **soi**	oe $2\left(\frac{5}{10}\times\frac{4}{9}\right)+2\left(\frac{4}{10}\times\frac{1}{9}\right)+2\left(\frac{5}{10}\times\frac{1}{9}\right)$ or $1-\left(\frac{5}{10}\times\frac{4}{9}\right)-\left(\frac{4}{10}\times\frac{3}{9}\right)$ accept equivalents over 90 throughout for method and grouping of products or M2 for the sum of any 4 of the above products oe isw or M1 for any the sum of any 2 of the above products oe isw Implied by $\frac{58}{100}$

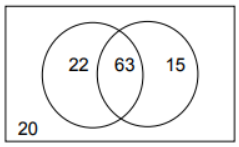
OCR GSCE – Wednesday 8 November 2017 – Paper 6 (Calculator) Higher Tier

73.

4	**(a)**		$\frac{12}{28} = \frac{3}{7}$ or $\frac{3}{7}$ of 28 = 12 or $12 \div 28 = \frac{3}{7}$	**1**		Alternative $12 \div 28 = 0.428571\ldots$ and $3 \div 7 = 0.428571\ldots$
	(b)		Integer from 23000 to 23334	**2**	**M1** for $10\,000 \div \frac{3}{7}$ oe If **M0** then **SC1** for figs 2333… seen	Accept integer from 23000 to 24000 after **M1**
	(c)		The growing conditions on the farm may be **different** to the garden oe or Sample too small oe	**1**		Mere reference to factors that affect growth is insufficient

OCR GSCE – Thursday 8 June 2017 – Paper 5 (Non - Calculator) Higher Tier

74.

18			$\frac{22}{85}$ oe	**5**	isw conversion to other forms **M1** for (85 +78 +20) – 120 oe soi Or for 120 – 20 – 78 oe **B2FT** for correctly completed diagram with 85 – *x*, *x* [*their 63*], 78 – *x*, 20 correctly placed FT *their x* (can be algebraic or *x* is an integer $0 < x < 78$) Or **B1FT** for attempt at Venn diagram with 85 – *x* or 78 – *x* or 20 correctly placed FT *their x* (can be algebraic or *x* is an integer $0 < x < 78$) **B1** for $\frac{n}{85}$ or $\frac{22}{n}$ (both proper fractions) seen	For 5 marks accept 0.2588.. or 0.259 or 25.88…% to 25.9% M1 implied by 63 or 22 seen  For B1, condone omission of rectangle for universal set

OCR GSCE – Tuesday 13 June 2017 – Paper 6 (Calculator) Higher Tier

75.

6	a	i	<table><tr><td>×</td><td>1</td><td>2</td><td>2</td><td>3</td><td>4</td></tr><tr><td>1</td><td>1</td><td>2</td><td>2</td><td>3</td><td>4</td></tr><tr><td>2</td><td>2</td><td>4</td><td>4</td><td>6</td><td>8</td></tr><tr><td>2</td><td>2</td><td>4</td><td>4</td><td>6</td><td>8</td></tr><tr><td>3</td><td>3</td><td>6</td><td>6</td><td>9</td><td>12</td></tr><tr><td>4</td><td>4</td><td>8</td><td>8</td><td>12</td><td>16</td></tr></table>	**2** 2 AO1.3a	**B1** for table completed with no more than 5 errors or omissions	Ignore negative signs
		ii	$\frac{9}{25}$ oe	**2** 1 AO2.1a 1 AO2.3a	**B1FT** for *their* correct numerator **B1** for fraction with denominator 25	Ignore attempts to convert form or simplify Accept [0].36 or 36% but not ratio or in words
	b		Spinner completed with 3 negative numbers and 2 positives or 2 negatives and 3 positives	**3** 2 AO3.1a 1 AO3.2	**M1** for $\frac{12}{25}$ soi eg by 12 [out of 25] **M1** for spinner with 5 numbers inserted, at least one negative	Do not accept 0 for **3** marks Not just 12 as a number on the spinner Condone 0 (as positive) for **M1**

OCR GSCE – Sample Papers – Paper 4 (Calculator) Higher Tier

76.

7	(a)		50	**2** 2 AO1.3a	**B1** for $\frac{1}{6}$	
	(b)	(i)	$\frac{2}{5}$ **oe**	**1** 1 AO2.1b		
		(ii)	$\frac{1}{5}$ **oe**	**1** 1 AO2.1b		
	(c)		No evidence that Dan knows what Ethan is thinking as over the 15 trials the relative frequency of $\frac{1}{5}$ is very close to the theoretical probability of $\frac{1}{6}$	**2** 1 AO2.5a 1 AO3.3	**M1** for reason not including reference to $\frac{1}{5}$ relative frequency or $\frac{1}{6}$ theoretical probability **FT** *their* **(a)** and **(b)**	

OCR GSCE – Sample Papers – Paper 5 (Non - Calculator) Higher Tier

77.

3	(a)		Outcomes not equally likely **oe**	**1** 1 AO3.4b		

	(b)		Larger number of trials	**1** 1 AO3.4a		
	(c)		0.09 - 0.16	**2** 1 AO1.3a 1 AO2.1b	**M1** for $\left(\frac{48}{150}\right)^2$ or 0.35^2 or any reasonable estimate (**FT** *their* **(b)**)	

OCR GSCE – Sample Papers – Paper 5 (Non - Calculator) Higher Tier

78.

6			5 red 20 blue	**3** 1 AO1.3b 1 AO3.1b 1 AO3.2	**M1** for listing at least two pairs of red and blue marbles giving a probability $\frac{1}{5}$ **M1** for at adding 5 red marbles to at least two pairs **SC2** for 10 and 20 pairing **seen**	

AQA GSCE – Thursday 4 June 2020 – Paper 2 (Calculator) Higher Tier

79.

	Alternative method 1		
27	$\frac{4}{20} \times \frac{16}{19}$ or $\frac{64}{380}$ or $\frac{16}{95}$ or $\frac{6}{20} \times \frac{10}{19}$ or $\frac{60}{380}$ or $\frac{3}{19}$ or $\frac{7}{20} \times \frac{3}{19}$ or $\frac{21}{380}$	M1	oe fractions or decimals condone $\frac{4}{20} \times \frac{16}{20}$ etc
	Any 2 of $\frac{4}{20} \times \frac{16}{19}$ or $\frac{64}{380}$ or $\frac{16}{95}$ and $\frac{6}{20} \times \frac{10}{19}$ or $\frac{60}{380}$ or $\frac{3}{19}$ and $\frac{7}{20} \times \frac{3}{19}$ or $\frac{21}{380}$	M1dep	oe fractions or decimals
	$\frac{4}{20} \times \frac{16}{19} + \frac{6}{20} \times \frac{10}{19} + \frac{7}{20} \times \frac{3}{19}$ or $\frac{64}{380} + \frac{60}{380} + \frac{21}{380}$	M1dep	oe fractions or decimals eg $\frac{16}{95} + \frac{3}{19} + \frac{21}{380}$
	$\frac{145}{380}$ or $\frac{29}{76}$ or [0.381, 0.382] or [38.1%, 38.2%]	A1	accept 0.38 or 38% with full working SC2 $\frac{145}{400}$ or $\frac{29}{80}$ or 0.3625 or 36.25%

Mark scheme and Additional Guidance continues on the next 4 pages

Q	Answer	Mark	Comments
27 cont	**Alternative method 2**		
	$\frac{6}{20} \times \frac{4}{19}$ or $\frac{24}{380}$ or $\frac{6}{95}$ or $\frac{7}{20} \times \frac{10}{19}$ or $\frac{70}{380}$ or $\frac{7}{38}$ or $\frac{3}{20} \times \frac{17}{19}$ or $\frac{51}{380}$	M1	oe fractions or decimals condone $\frac{6}{20} \times \frac{4}{20}$ etc
	Any 2 of $\frac{6}{20} \times \frac{4}{19}$ or $\frac{24}{380}$ or $\frac{6}{95}$ and $\frac{7}{20} \times \frac{10}{19}$ or $\frac{70}{380}$ or $\frac{7}{38}$ and $\frac{3}{20} \times \frac{17}{19}$ or $\frac{51}{380}$	M1dep	oe fractions or decimals
	$\frac{6}{20} \times \frac{4}{19} + \frac{7}{20} \times \frac{10}{19} + \frac{3}{20} \times \frac{17}{19}$ or $\frac{24}{380} + \frac{70}{380} + \frac{51}{380}$	M1dep	oe fractions or decimals eg $\frac{6}{95} + \frac{7}{38} + \frac{51}{380}$
	$\frac{145}{380}$ or $\frac{29}{76}$ or [0.381, 0.382] or [38.1%, 38.2%]	A1	accept 0.38 or 38% with full working SC2 $\frac{145}{400}$ or $\frac{29}{80}$ or 0.3625 or 36.25%

27 cont	**Alternative method 3**		
	$\frac{6}{20} \times \frac{15}{19}$ or $\frac{90}{380}$ or $\frac{9}{38}$ or $\frac{7}{20} \times \frac{9}{19}$ or $\frac{63}{380}$ or $\frac{3}{20} \times \frac{2}{19}$ or $\frac{6}{380}$ or $\frac{3}{190}$	M1	oe fractions or decimals condone $\frac{6}{20} \times \frac{15}{20}$ etc
	Any 2 of $\frac{6}{20} \times \frac{15}{19}$ or $\frac{90}{380}$ or $\frac{9}{38}$ and $\frac{7}{20} \times \frac{9}{19}$ or $\frac{63}{380}$ and $\frac{3}{20} \times \frac{2}{19}$ or $\frac{6}{380}$ or $\frac{3}{190}$	M1dep	oe fractions or decimals
	$1 - \frac{4}{20} - \frac{6}{20} \times \frac{15}{19} - \frac{7}{20} \times \frac{9}{19}$ $- \frac{3}{20} \times \frac{2}{19}$ or $1 - \frac{4}{20} - \frac{90}{380} - \frac{63}{380} - \frac{6}{380}$	M1dep	oe fractions or decimals eg $1 - \frac{1}{5} - \frac{9}{38} - \frac{63}{380} - \frac{3}{190}$
	$\frac{145}{380}$ or $\frac{29}{76}$ or [0.381, 0.382] or [38.1%, 38.2%]	A1	accept 0.38 or 38% with full working SC2 $\frac{145}{400}$ or $\frac{29}{80}$ or 0.3625 or 36.25%

Q	Answer	Mark	Comments
27 cont	**Alternative method 4**		
	$\frac{7}{20} \times \frac{16}{19}$ or $\frac{112}{380}$ or $\frac{28}{95}$ or $\frac{6}{20} \times \frac{9}{19}$ or $\frac{54}{380}$ or $\frac{27}{190}$ or $\frac{4}{20} \times \frac{3}{19}$ or $\frac{12}{380}$ or $\frac{3}{95}$	M1	oe fractions or decimals condone $\frac{7}{20} \times \frac{16}{20}$ etc
	Any 2 of $\frac{7}{20} \times \frac{16}{19}$ or $\frac{112}{380}$ or $\frac{28}{95}$ and $\frac{6}{20} \times \frac{9}{19}$ or $\frac{54}{380}$ or $\frac{27}{190}$ and $\frac{4}{20} \times \frac{3}{19}$ or $\frac{12}{380}$ or $\frac{3}{95}$	M1dep	oe fractions or decimals
	$1 - \frac{3}{20} - \frac{7}{20} \times \frac{16}{19} - \frac{6}{20} \times \frac{9}{19} - \frac{4}{20} \times \frac{3}{19}$ or $1 - \frac{3}{20} - \frac{112}{380} - \frac{54}{380} - \frac{12}{380}$	M1dep	oe fractions or decimals eg $1 - \frac{3}{20} - \frac{28}{95} - \frac{27}{190} - \frac{3}{95}$
	$\frac{145}{380}$ or $\frac{29}{76}$ or [0.381, 0.382] or [38.1%, 38.2%]	A1	accept 0.38 or 38% with full working SC2 $\frac{145}{400}$ or $\frac{29}{80}$ or 0.3625 or 36.25%

27 cont	**Alternative method 5**		
	4×16 or 6×10 or 7×3 or 3×17 or 7×10 or 6×4	M1	oe eg 64 or 60 or 21 or 51 or 70 or 24
	Any 2 of 4×16 and 6×10 and 7×3 or any 2 of 3×17 and 7×10 and 6×4	M1dep	oe implied by 145
	$\frac{4\times16+6\times10+7\times3}{20\times19}$ or $\frac{3\times17+7\times10+6\times4}{20\times19}$	M1dep	oe
	$\frac{145}{380}$ or $\frac{29}{76}$ or [0.381, 0.382] or [38.1%, 38.2%]	A1	accept 0.38 or 38% with full working SC2 $\frac{145}{400}$ or $\frac{29}{80}$ or 0.3625 or 36.25%
	Additional Guidance		
	Ignore simplification or conversion attempt after correct answer seen		
	For M marks accept oe decimals rounded to 2 dp or better		
	Select the scheme that favours the student for the first 2 M marks even if not subsequently used		
	Using $\frac{4}{20} \times \frac{16}{20}$ etc can score M1M0M0A0 or SC2		
	Do not award marks if a fraction comes from an incorrect method eg Alt 1 $\frac{4}{20} \times \frac{15}{19} = \frac{3}{19}$		M0

AQA GSCE – Thursday 8 June 2020 – Paper 3 (Calculator) Higher Tier

80.

4	$\frac{1}{16}$	B1	

AQA GSCE – Thursday 8 June 2020 – Paper 3 (Calculator) Higher Tier

81.

11	**Alternative method 1**		
	$1 - 0.18 - 0.62$ or 0.2	M1	oe
	their 0.2×350	M1dep	oe
	70	A1	
	Alternative method 2		
	0.18×350 or 63 or 0.62×350 or 217 or 0.8×350 or 280	M1	oe
	$350 -$ their $63 -$ their 217 or $350 - 280$	M1dep	oe
	70	A1	
	Additional Guidance		
	$\frac{70}{350}$ on answer line		M1M1A0
	0.8		M0M0A0

AQA GSCE – Thursday 8 June 2020 – Paper 3 (Calculator) Higher Tier

82.

Q	Answer	Mark	Comments
22	$\frac{120}{250}$ or 0.48 or $\frac{130}{250}$ or 0.52 or $\frac{17}{32}$ or 0.53125 or $\frac{15}{32}$ or 0.46875	M1	oe
	$\frac{120}{250} \times \frac{17}{32}$ or $\frac{51}{200}$ or 0.255	M1	oe implies 1st and 2nd M1
	$\frac{130}{250} \times \frac{15}{32}$ or $\frac{39}{160}$ or 0.24375	M1	oe implies 1st and 3rd M1
	0.255 and 0.24375 and Yes	A1	must be comparable if fractions used eg $\frac{204}{800}$ and $\frac{195}{800}$ and Yes
	Additional Guidance		
	Accept values given as percentages		
	Accept decimal values truncated or rounded to 2 dp or better		

AQA GSCE – Thursday 6 June 2019 – Paper 2 (Calculator) Higher Tier

83.

18	(b : g =) 4 : 1 or (b : w =) 6 : 10 or states a number of blue discs that is four times the number of green discs or states a number of blue discs and a number of white discs that are in the ratio 3 : 5 (not 3 and 5) or $b = 4g$ or $\frac{b}{w} = \frac{3}{5}$	M1	oe ratio or equation eg (b : g =) 3 : 0.75 or 4 blue 1 green or 6 blue 10 white or $5b = 3w$ do not allow (b : w =) 3 : 5
	Three numbers of the form $12n$, $3n$ and $20n$ where $n > 0$ or unsimplified fraction equivalent to $\frac{32}{35}$	A1	any order may be seen in a ratio or as numbers of discs eg 12 : 3 : 20 or 100 15 60 or 3 0.75 5 or 4 : 1 : $\frac{20}{3}$ or $\frac{12+20}{12+3+20}$ or $\frac{3+5}{3+0.75+5}$ or $\frac{8}{8.75}$ or $\frac{b+\frac{5}{3}b}{b+\frac{5}{3}b+\frac{1}{4}b}$ or $\frac{\frac{8}{3}b}{\frac{35}{12}b}$
	$\frac{32}{35}$ or 0.91(4…) or 91.(4…)%	A1	oe fraction eg $\frac{64}{70}$

18 cont	**Additional Guidance**	
	Ignore conversion of a correct fraction to a decimal or percentage	
	Ignore incorrect simplification of a correct fraction	
	Answer 32 : 35	M1A1A0
	Final A1 fraction answers must be $\frac{\text{integer}}{\text{integer}}$	
	1 : 4 only scores M1 if indicated as g : b	
	10 : 6 only scores M1 if indicated as w : b	
	1st M1 may be embedded eg1 b : g : w = 4 : 1 : 10 eg2 b : g : w = 6 : 3 : 10	 M1 M1
	Condone 4b : g as an indication of 4 blue and 1 green etc	

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84.

2	$\frac{9}{25}$	B1	

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85.

1	A and B	B1	
	Additional Guidance		

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86.

	$\frac{10}{10+7+3}$ or $\frac{10}{20}$ or $\frac{5}{10}$ or $\frac{1}{2}$ or 0.5	M1	oe eg 50%
	$\frac{1}{8}$ or 0.125 or 12.5%	A1	oe eg $\frac{1000}{8000}$ or $\frac{125}{1000}$
	Additional Guidance		
18(a)	Ignore incorrect conversion if correct answer seen		
	Answer $\frac{1}{2}$		M1
	10 out of 20		M0
	10 : 20		M0
	Answer 1 out of 8		M1A0
	Answer 1 : 8 is A0 but M1 is possible		
	$\frac{10}{20}$ $\frac{7}{20}$ $\frac{3}{20}$		M1

	$\frac{10}{19}$ or $\frac{3}{19}$	M1	oe allow [0.52, 0.53] or [0.15, 0.16]
	$\frac{10}{19} \times \frac{3}{18}$ (× 2) or $\frac{3}{19} \times \frac{10}{18}$ (× 2) or $\frac{5}{57}$ (× 2) or [0.087, 0.088] (× 2)	M1dep	oe eg $1 \times \frac{10}{19} \times \frac{3}{18}$ or $\frac{30}{342}$ allow [0.52, 0.53] × [0.16, 0.17] or [0.15, 0.16] × [0.55, 0.56]
	$\frac{10}{57}$ or 0.175... or 17.5...%	A1	oe eg $\frac{60}{342}$ SC2 $\frac{7}{38}$ or 0.184... oe
	Additional Guidance		
18(b)	$\frac{7}{20} \times \frac{10}{19} \times \frac{3}{18}$		M1M0A0
	$\frac{7}{20} \times \frac{3}{19} \times \frac{10}{18}$		M1M0A0
	If more than one product is seen, the correct one(s) must be selected for 2nd M1 $\frac{10}{19} \times \frac{6}{18} + \frac{3}{19} \times \frac{10}{18}$		M1M0A0
	Both correct products selected but multiplied together scores M1 only $\frac{10}{19} \times \frac{3}{18} \times \frac{3}{19} \times \frac{10}{18}$		M1M0A0
	Ignore incorrect conversion if correct answer seen		
	5 out of 57 cannot score 2nd M1 but implies 1st M1		
	5 : 57 cannot score 2nd M1 but 1st M1 is possible		
	Answer 10 out of 57		M1M1A0
	Answer 10 : 57 is A0 but M2 or M1M0 is possible		

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87.

13	200	B1	
	Additional Guidance		

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88.

16	**Alternative method 1**		
	0.38 × 50 or 19	M1	oe
	0.6 × 80 or 48	M1	oe
	$\frac{\text{their } 19 + \text{their } 48}{50 + 80}$ or $\frac{67}{130}$	M1dep	oe
	0.51(5…) or 0.52 or $\frac{67}{130}$ and (67 × 2 =) 134 or $\frac{67}{130}$ and (130 ÷ 2 =) 65	A1	oe
	Alternative method 2		
	0.38 × 50 or 19	M1	oe
	0.6 × 80 or 48	M1	oe
	0.5 × (50 + 80) or 65	M1dep	oe
	65 and 67	A1	
	Alternative method 3		
	0.38 × 50 or 19	M1	oe
	0.5 × (50 + 80) or 65	M1	oe
	$\frac{\text{their } 65 - \text{their } 19}{80}$ or $\frac{46}{80}$	M1dep	oe
	0.575	A1	

Continues on next page

16 cont	**Alternative method 4**		
	0.6 × 80 or 48	M1	oe
	0.5 × (50 + 80) or 65	M1	oe
	$\frac{\text{their } 65 - \text{their } 48}{50}$ or $\frac{17}{50}$	M1dep	oe
	0.34	A1	
	Alternative method 5		
	$\frac{50}{130}$ × 0.38 or 0.14… or 0.15	M1	oe
	$\frac{80}{130}$ × 0.6 or 0.36… or 0.37	M1	oe
	their 0.14… + their 0.36…	M1dep	oe
	0.51(5…) or 0.52	A1	
	Additional Guidance		

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89.

15	**Alternative method 1**		
	0.25 + 0.15 + 0.3 or 0.7	M1	oe eg 1 – 0.05 – 0.05 – 0.2
	their 0.7 × 200	M1dep	oe implied by $\frac{140}{200}$
	140	A1	
	Alternative method 2		
	0.25 × 200 or 50 or 0.15 × 200 or 30 or 0.3 × 200 or 60	M1	oe
	0.25 × 200 + 0.15 × 200 + 0.3 × 200 or 50 + 30 + 60	M1dep	oe implied by $\frac{140}{200}$
	140	A1	
	Alternative method 3		
	(0.05 + 0.05 + 0.2) × 200 or 2 × 0.05 × 200 + 0.2 × 200 or 2 × 10 + 40 or 60	M1	oe
	200 – their 60	M1dep	oe implied by $\frac{140}{200}$
	140	A1	
	Additional Guidance		
	Ignore attempt to simplify $\frac{140}{200}$		M1M1A0
	$\frac{140}{200}$ and 140 both on answer line		M1M1A0
	Do not allow a misread of any probability		

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90.

7(a)	Two different probabilities from $\frac{15}{20}$ or 0.75 or 75% or $\frac{22}{30}$ or 0.73... or 73.(...)% or $\frac{17}{40}$ or 0.425 or 0.43 or 42.5% or 43% or $\frac{54}{90}$ or 0.6 or 60% or $\frac{37}{50}$ or 0.74 or 74% or $\frac{32}{60}$ or 0.53... or 53.(...)% or $\frac{39}{70}$ or 0.557... or 0.56 or 55.7...% or 56%	B2	oe B1 for one correct probability

Additional guidance continues on the next page

	Additional Guidance	
7(a) cont	Accept $\frac{108}{180}$ as one of the probabilities	
	Mark the answer line if it has two answers ignoring any incorrect probabilities in the working lines	
	Ignore any incorrect cancelling or change of form (fraction, decimal or percentage)	
	If the answer line only has one answer, check the working lines for a second answer for B2. Ignore any extra probabilities, unless incorrect, in which case award B1 max eg Working lines $\frac{15}{20}$ Answer line $\frac{54}{90}$ eg Working lines $\frac{15}{20}$, $\frac{5}{15}$ Answer line $\frac{54}{90}$	 B2 B1
	If the answer line is blank, check the working lines for answers for B1 or B2. Ignore any extra probabilities, unless incorrect, in which case award B1 max eg Working lines $\frac{15}{20}$, $\frac{22}{30}$, $\frac{54}{90}$ Answer line blank eg Working lines $\frac{15}{20}$, $\frac{5}{15}$, $\frac{54}{90}$ Answer line blank	 B2 B1
	Probabilities must not be given as ratios	
	Do not accept the average of the given probabilities as answer	

7(b)	**Alternative method 1 (ft their part (a))**		
	Their probability with the greater number of trials and valid reason eg More throws	B1ft	ft their two different probabilities from part (a) both probabilities must have a denominator based on throws
	Alternative method 2 (independent of part (a))		
	$\frac{54}{90}$ and valid reason eg Total throws	B1	oe
	Additional Guidance		
	Accept any unambiguous indication of their probability eg the day		
	Using ratios		B0
	Ignore any non-contradictory statements		
	60% and It's for all three days		B1
	$\frac{54}{90}$ and It takes into account more throws		B1
	$\frac{17}{40}$ (with $\frac{22}{30}$ also in (a)) and Because he threw it more on Wednesday		B1ft
	$\frac{54}{90}$ and Shows the overall probability		B1
	$\frac{54}{90}$ and Probability over total throws		B1
	$\frac{54}{90}$ (with Wednesday probability in (a)) and It's the average total days, not just Wednesdays		B1ft

Additional guidance continues on the next page

7(b) cont	Correct ft probability or $\frac{54}{90}$ and It's more reliable	B0
	$\frac{54}{90}$ and There's a lot of data	B0
	Correct ft probability or $\frac{54}{90}$ and He may get better with more throws	B0
	$\frac{54}{90}$ and He throws 90 times	B0
	Correct ft probability or $\frac{54}{90}$ and More hits	B0

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91.

27	$\frac{10}{30}$ and $\frac{9}{31}$ seen or $\frac{1}{3}$ and $\frac{9}{31}$ seen	M1	oe accept 0.33… and 0.29…
	$\frac{10}{30} \times \frac{9}{31} \times \frac{8}{32}$ or $\frac{1}{3} \times \frac{9}{31} \times \frac{1}{4}$	M1dep	oe accept 0.33… and 0.29… and 0.25
	$\frac{3}{124}$ or [0.0239, 0.0242]	A1	oe eg $\frac{720}{29\,760}$
	Additional Guidance		
	Fractions do not have to be in simplest form		
	$\frac{10}{30} \times \frac{9}{31} \times \frac{8}{32} \times \frac{7}{33}$		M1M0
	$\frac{10}{30} + \frac{9}{31} + \frac{8}{32}$		M1M0

AQA GSCE – Thursday 2 November 2017 – Paper 1 (Non - Calculator) Higher Tier

92.

	Alternative method 1		
	$x + 2x + 2x + 10$ or $5x + 10$ or $x + 2x + 2x + 10 + 90$ or $5x + 100$	M1	oe
	$x + 2x + 2x + 10 = 360 - 90$ or $5x + 10 = 270$ or $x + 2x + 2x + 10 + 90 = 360$ or $5x + 100 = 360$ or $5x = 260$	M1dep	oe
	$(x =)\ 52$ or $2x = 104$ or $2x + 10 = 114$	A1	May be on diagram
	$\frac{114}{360}$ or $\frac{57}{180}$ or $\frac{38}{120}$ or $\frac{19}{60}$ or 0.31(6..) or 0.317 or 0.32 or 31(.6…)% or 31.7% or 32%	B1ft	ft $\frac{2 \times \text{their } 52 + 10}{360}$ or $\frac{\text{their angle for C}}{360}$
11	**Alternative method 2**		
	$\frac{90}{360} + \frac{x}{360} + \frac{2x}{360} + \text{P(C)} = 1$ or $\frac{90}{360} + \frac{x}{360} + \frac{2x}{360} + \frac{2x+10}{360}$ or $\frac{2x+10}{5x+100}$	M1	oe
	$\frac{90}{360} + \frac{x}{360} + \frac{2x}{360} + \frac{2x+10}{360} = 1$	M1dep	oe
	$(x =)\ 52$ or $2x = 104$ or $2x + 10 = 114$	A1	May be on diagram
	$\frac{114}{360}$ or $\frac{57}{180}$ or $\frac{38}{120}$ or $\frac{19}{60}$ or 0.31(6..) or 0.317 or 0.32 or 31(.6…)% or 31.7% or 32%	B1ft	ft $\frac{2 \times \text{their } 52 + 10}{360}$ or $\frac{\text{their angle for C}}{360}$

	Additional Guidance	
11 cont	Ignore incorrect simplification or conversion after $\frac{114}{360}$ oe	M1M1A1B1
	$\frac{360-10-90}{5}$ oe	M1M1
	$x + 2x + 2x + 10$ followed by $6x + 10 = 270$	M1M0
	Do not accept decimal within fraction for final answer if correct fraction not seen	
	The follow through is not available if A1 awarded	

AQA GSCE – Thursday 2 November 2017 – Paper 1 (Non - Calculator) Higher Tier

93.

27	**Alternative method 1**		
	(B, B) $\frac{8}{11}$ and $\frac{7}{10}$ or (R, R) $\frac{3}{11}$ and $\frac{2}{10}$	M1	oe may be seen on tree diagram
	(B, B) $\frac{8}{11} \times \frac{7}{10}$ or $\frac{56}{110}$ or (R, R) $\frac{3}{11} \times \frac{2}{10}$ or $\frac{6}{110}$	M1dep	oe may be seen on tree diagram
	$\frac{8}{11} \times \frac{7}{10} + \frac{3}{11} \times \frac{2}{10}$	M1dep	$\frac{56}{110} + \frac{6}{110}$
	$\frac{62}{110}$ or $\frac{31}{55}$	A1	oe fraction accept 0.56(…) or 56.(…)%
	Alternative method 2		
	(B, R) $\frac{8}{11}$ and $\frac{3}{10}$ or (R, B) $\frac{3}{11}$ and $\frac{8}{10}$	M1	oe may be seen on tree diagram
	(B, R) $\frac{8}{11} \times \frac{3}{10}$ or (R, B) $\frac{3}{11} \times \frac{8}{10}$ or $\frac{24}{110}$	M1dep	oe may be seen on tree diagram
	$1 - \frac{8}{11} \times \frac{3}{10} - \frac{3}{11} \times \frac{8}{10}$	M1dep	$1 - \frac{24}{110} - \frac{24}{110}$
	$\frac{62}{110}$ or $\frac{31}{55}$	A1	oe fraction accept 0.56(…) or 56.(…)%
	Additional Guidance		
	Ignore incorrect simplification or conversion after a correct fraction		M3A1
	$\frac{6820}{12\,100}$		M3A1

AQA GSCE – Thursday 8 June 2017 – Paper 2 (Calculator) Higher Tier

94.

5(a)	$\frac{1}{4}$ or 0.25 or 25%	B1	oe
	Additional Guidance		
	Ratio eg 1 : 4 or 1 : 3		B0
	$\frac{1}{4}$ seen and answer 1 : 4		B1
	Expressed only in words eg 1 out of 4		B0
	1 out of 4 and $\frac{1}{4}$		B1
	$\frac{1}{4}$ seen with change to incorrect decimal or incorrect percentage eg $\frac{1}{4}$ and answer 0.4		B1
	Ignore chance words if $\frac{1}{4}$ seen eg $\frac{1}{4}$ and answer Likely		B1

5(b)	(1 ×) 10 (×) 10 (×) 5 or $\frac{10\times10\times10}{2}$ or $\frac{1000}{2}$	M1	oe
	500	A1	SC1 5 or 324 or 400 or 405
	Additional Guidance		
	10 + 10 + 5		M0A0
	SCs are for the answers from not including zero at least once ie 9 × 9 × 4 or 10 × 10 × 4 or 9 × 9 × 5 or from a misread ie 1 × 1 × 1 × 5		

AQA GSCE – Thursday 8 June 2017 – Paper 2 (Calculator) Higher Tier

95.

9	**Alternative method 1**		
	40	B1	May be implied eg $\frac{2}{40}$
	$2 + x + 2x + 5$ = their 40 or $3x + 7$ = their 40 or (their 40 – 2 – 5) ÷ 3 or 33 ÷ 3	M1	oe equation eg $3x + 5 = 38$ (scores B1M1) their 40 must be an integer
	$(x =)$ 11	A1ft	ft B0M1 Does not have to be an integer Accept answer rounded or truncated to at least 2 sf
	$\frac{27}{40}$ or 0.675 or 67.5%	B1ft	Only ft evaluation of $\frac{2\times\text{their integer}\,x+5}{40}$ and 0 < answer < 1 Denominator must be 40 (may subsequently be simplified)
	Alternative method 2		
	$\frac{2}{2+x+2x+5}=\frac{1}{20}$ or $\frac{x+2x+5}{2+x+2x+5}=\frac{19}{20}$	M2	oe equation
	$(x =)$ 11	A1	
	$\frac{27}{40}$ or 0.675 or 67.5%	B1ft	Only ft evaluation of $\frac{2\times\text{their integer}\,x+5}{40}$ and 0 < answer < 1 Denominator must be 40 (may subsequently be simplified)

Alternative methods 3, 4 and Additional Guidance continue on the next two pages

9 cont	**Alternative method 3**		
	$3x \rightarrow 100\% - 5\% - 12.5\%$ or $3x \rightarrow 82.5\%$	M1	Using $2 \rightarrow 5\%$ and $5 \rightarrow 12.5\%$ oe
	$x \rightarrow 82.5\% \div 3$ or $x \rightarrow 27.5\%$	M1dep	oe
	$2x + 5 \rightarrow 2 \times 27.5\% + 12.5\%$	M1dep	oe
	$\frac{27}{40}$ or 0.675 or 67.5%	A1	
	Alternative method 4		
	$3x \rightarrow 1 - \frac{1}{20} - \frac{2.5}{20}$ or $3x \rightarrow \frac{16.5}{20}$	M1	Using $2 \rightarrow \frac{1}{20}$ and $5 \rightarrow \frac{2.5}{20}$ oe
	$x \rightarrow \frac{16.5}{20} \div 3$ or $x \rightarrow \frac{5.5}{20}$	M1dep	oe
	$2x + 5 \rightarrow 2 \times \frac{5.5}{20} + \frac{2.5}{20}$ or $2x + 5 \rightarrow \frac{13.5}{20}$	M1dep	oe
	$\frac{27}{40}$ or 0.675 or 67.5%	A1	

Additional Guidance continues on the next page

	Additional Guidance	
9 cont	(Alt 1) $x = 6$ (no working) Answer $\frac{17}{40}$ (first B1 implied)	B1M0A0B1ft
	(Alt 1) $2 + x + 2x + 5 = 20$ $x = \frac{13}{3}$ Answer $\frac{13.666}{20}$	B0M1 A1ftB0ft
	Answer $\frac{13.5}{20}$	B1M1A1B0
	11 by inspection or T & I scores the first 3 marks	
	Answer $\frac{2x+5}{40}$	B1M0A0B0
	Answer $\frac{2x+5}{3x+7}$	Zero
	Ratio eg 27 : 40	B1M1A1B0
	Expressed only in words eg 27 out of 40	B1M1A1B0
	27 out of 40 and $\frac{27}{40}$	B1M1A1B1
	$\frac{27}{40}$ seen with incorrect change of form or incorrect cancelling eg $\frac{27}{40}$ and answer 0.27	B1M1A1B1
	Ignore chance words if $\frac{27}{40}$ seen eg $\frac{27}{40}$ and answer Unlikely	B1M1A1B1

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96.

5	200 ÷ 0.4 or 200 ÷ 40 × 100 or 200 = 0.4 × n	M1	oe (Heads =) 300 200 : 300
	500	A1	
	Additional Guidance		
	Build up method must be complete eg 200 = 40%, 100 = 20%, 500 (= 100%) 200 = 40%, 100 = 20%, 400 = 80%, 100 + 400 200 = 40%, 100 = 20%, 400 = 80%		 M1A1 M1A0 M0A0
	0.4 : 0.6 = 200 : 300		M1A0
	100 = 20%, 300 = 60%		M1A0
	200 ÷ 0.4 = 500, 500 + 200 = 700 incorrect method		M0A0

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97.

9(a)	$\frac{2}{3}$ × 720 or $\frac{3}{5}$ × 700	M1	oe Accept use of 0.66… or 0.67
	480 or 420	A1	
	900	A1	Ignore fw
	Additional Guidance		
	900 with no working		M1A1A1
	900 out of 1420 or $\frac{900}{1420}$ (ignore fw)		M1A1A1
	$\frac{480}{720}$ (480 boys out of 720) or $\frac{420}{1420}$ (420 girls out of 1420 students)		M1A1A0

9(b)	**Alternative method 1**		
	720 + 700 or 1420 or 720 + 700 – their 900 or 520	M1	oe
	$\frac{520}{1420}$ or $\frac{26}{71}$	A1ft	oe fraction, decimal or percentage 0.36(6…) or 0.37 36.(6…)% or 37% ft their part (a) Ignore fw
	Alternative method 2		
	720 + 700 or 1420 or $\frac{1}{3}$ × 720 or 240 or $\frac{2}{5}$ × 700 or 280 or 240 + 280 or 520	M1	oe
	$\frac{520}{1420}$ or $\frac{26}{71}$	A1	oe fraction, decimal or percentage 0.36(6…) or 0.37 36.(6…)% or 37% Ignore fw
	Alternative method 3		
	720 + 700 or 1420 or $\frac{900}{1420}$ or $\frac{45}{71}$ or $\frac{\text{their } 900}{1420}$	M1	oe fraction, decimal or percentage 0.63… or 0.63 63.(…)% or 63%
	$\frac{520}{1420}$ or $\frac{26}{71}$	A1ft	oe fraction, decimal or percentage 0.36(6…) or 0.37 36.(6…)% or 37% ft their part (a) Ignore fw

9(b) cont	**Additional Guidance**	
	$\frac{520}{1420}$ followed by incorrect simplification of fraction	M1A1

AQA GSCE – Sample Paper 1 (Non - Calculator) Higher Tier

98.

14(a)	$0.16 + 0.24 + 0.16 + 0.24$ or $0.8(0)$	M1	
	0.2	A1	oe
14(b)	0.4(0)	B1	
14(c)	**Alternative method 1**		
	$4 \div 0.16$ or 1 number $\leftrightarrow$ 0.04	M1	oe
	25	A1	oe
	Alternative method 2		
	$\frac{0.24}{0.16} \times 4$ or 6 or $\frac{\text{their } x}{0.16} \times 4$ or 5	M1	oe Attempt to work out how many prime numbers in the range $361 \leqslant n < 390$ or $421 \leqslant n < 450$ or $331 \leqslant n < 360$
	25	A1	

AQA GSCE – Sample Paper 2 (Calculator) Higher Tier

99.

7(a)	Two of $\frac{6}{50}$ $\frac{28}{100}$ $\frac{34}{150}$	B2	oe fraction, decimal, percentage B1 One of $\frac{6}{50}$ $\frac{28}{100}$ $\frac{34}{150}$ with at most one incorrect answer
7(b)	Chooses their probability from the larger number of trials and reason given that more trials are involved	B1ft	Must have two probabilities in (a)

AQA GSCE – Sample Paper 3 (Calculator) Higher Tier

100.

6	$9 + 3x + x - 5 + 2x$ or $6x + 4$ or $3x + x - 5 + 2x$ or $6x - 5$	M1	oe
	their $(6x + 4) = 100$ or their $6x - 5 = 91$ or $6x = 96$	M1	oe $\frac{9}{\text{their } (6x + 4)} = \frac{9}{100}$
	$x = 16$	A1	
	$\frac{11}{100}$	B1ft	ft their 16

AQA GSCE – Sample Paper 3 (Calculator) Higher Tier

101.

22	$\frac{9}{27}$ or $\frac{18}{27}$ or fraction with denominator 22	M1	oe
	$\frac{9}{27} \times \frac{8}{22}$ or $\frac{72}{594}$ or $\frac{18}{27} \times \frac{7}{22}$ or $\frac{126}{594}$	M1	oe
	their $\frac{72}{594}$ + their $\frac{126}{594}$ or $\frac{198}{594}$	M1dep	oe dep on 2nd M1
	Clear indication that $\frac{198}{594}$ and $\frac{9}{27}$ are equivalent fractions	A1	