

| | | | | |
|---|--|---------------|----|---|
| 1 | | $\frac{4}{9}$ | M1 | for listed outcomes (allow 1 error eg omission or repeat) or |
| | | | A1 | fractions $\frac{1}{3} \times \frac{2}{3} + \frac{2}{3} \times \frac{1}{3}$ for $\frac{4}{9}$ oe |

| | | | | |
|---|--|----------------|----|--|
| 2 | | $\frac{1}{11}$ | 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 |

| | | | | |
|---|-----|-----------------|----|--|
| 3 | (a) | Mel (supported) | B1 | Mel with reference to greatest number of throws |
| | (b) | $\frac{2}{9}$ | M1 | selects overall total and multiplies P(point up) × P(point down) eg $\frac{50}{150} \times \frac{100}{150}$ oe (accept $\frac{14}{45} \times \frac{31}{45}$ or $\frac{27}{80} \times \frac{53}{80}$ or $\frac{9}{25} \times \frac{16}{25}$) |
| | | | A1 | for $\frac{2}{9}$ oe |

| | | | | | |
|---|--|-------------------|----|--|--|
| 4 | | $\frac{338}{350}$ | M1 | for $350 - 12 (=338)$ or $\frac{y}{350}$ oe where $y < 350$ and $y \neq 12$ or $1 - \frac{12}{350}$ oe | For the method mark probability fractions can be expressed as equivalent expressions, even if not correct probability notation eg. 338 : 350 scores M1 A0 Using correct probability notation Allow 0.96 to 0.97 or 96% to 97% |
| | | | A1 | oe | |

| | | | | | |
|---|-----|-------------|----|---|---|
| 5 | (a) | 8 | P1 | 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 $\frac{0.25}{0.45} \times 18 (=10)$ | 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. |
| | | | P1 | 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 $x = 0.1$ | |
| | | | P1 | 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 $\frac{0.2}{0.025}$ | |
| | | | A1 | cao | |
| | (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 | |

| | | | | |
|---|------------------------|----|---|---|
| 6 | blue 0.15 green 0.2 | P1 | for $1 - 0.4 - 0.25 (=0.35)$ oe | May work in percentages, condone missing % sign If the two numbers in the table sum to 0.35 that implies P1 One correct value in the table implies P2 7 can come from 3+4 Accept answers given in decimals, fractions or percentages. |
| | | P1 | for using the ratio, eg "0.35" ÷ (3 + 4) (=0.05) or "0.35" × $\frac{3}{7}$ (=0.15) or "0.35" × $\frac{4}{7}$ (=0.2) | |
| | | P1 | for a complete process $3 \times "0.05" (=0.15)$ and $4 \times "0.05" (=0.2)$ or "0.35" - "0.15" (=0.2) or "0.35" - "0.2" (=0.15) or green 0.15, blue 0.2 | |
| | | A1 | oe | |

| | | | | | |
|---|-----|----------------|----|--|--|
| 7 | (a) | $\frac{5}{11}$ | M1 | for $\frac{5}{n}$ where $n > 5$ or $\frac{m}{11}$ where $m < 11$ | where "11" comes from $5+2+4$ |
| | | | A1 | for $\frac{5}{11}$ oe | Accept any equivalent fraction, decimal form 0.45(45...) or percentage form 45(45...)% |
| | (b) | 0.7 | B1 | for 0.7 oe | Accept any equivalent fraction eg $\frac{7}{10}$ or percentage form eg 70% |

| | | | | | |
|---|-----|-------------------|----|--|---|
| 8 | (a) | 25 | B1 | cao | |
| | (b) | Simon with reason | C1 | <p>for Simon with reason</p> <p>Acceptable examples</p> <p>Simon; he uses more trials</p> <p>Simon; he does 10 times more</p> <p>Simon, since $100 > 10$</p> <p>Simon because he threw it more frequently / often</p> <p>Simon since he has a larger range of results</p> <p>Not acceptable examples</p> <p>Paula</p> <p>Simon (unsupported)</p> <p>Simon because he threw it 100 times</p> <p>He gets more tails</p> | If figures are given as part of the answer they must be correct |