

Grade 7 · Probability and Probability Models · Test Answer Key

Common Core 7.SP.C.5, 7.SP.C.6, 7.SP.C.7 · mathovore.fr

Use this key to grade the 20-point probability test. Each solution shows the full work, and the scoring note tells how points are earned. Give partial credit when the method is right but one calculation is wrong, and accept equivalent fractions or decimals.

Grade 7 Common Core: 7.SP.C.5 · 7.SP.C.6 · 7.SP.C.7

Question 1: Likelihood (2 points)

(a) No marble is blue, so $P(\text{blue}) = \frac{0}{10} = 0$. The event is **impossible**.

(b) Every marble is red, so $P(\text{red}) = \frac{10}{10} = 1$. The event is **certain**.

Scoring: 1 point for each part (probability and the matching word).

Question 2: Spinner probabilities (3 points)

(a) Green is on 3 of 6 sectors: $P = \frac{3}{6} = \frac{1}{2}$.

(b) Red is on 2 of 6 sectors: $P = \frac{2}{6} = \frac{1}{3}$.

(c) Blue is on 1 sector, so $P(\text{not blue}) = \frac{5}{6}$.

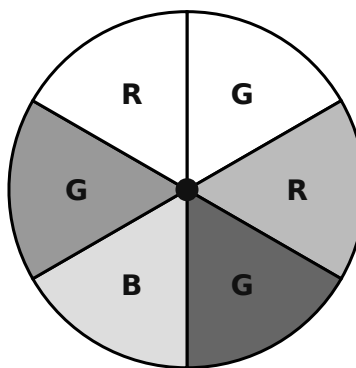


Figure. Green: 3 of 6 sectors; red: 2 of 6; blue: 1 of 6.

Scoring: 1 point for each part.

Question 3: Spinner experiment (3 points)

(a) $\frac{20}{40} = \frac{1}{2} = 0.5$.

(b) $\frac{14}{40} = \frac{7}{20} = 0.35$.

(c) Blue: $\frac{6}{40} = 0.15$, and $0.15 \times 200 = 30$. About **30** blues.

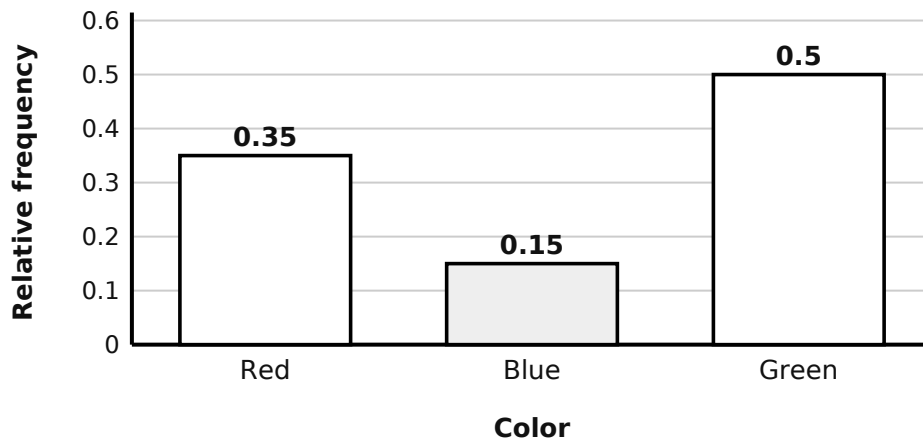


Figure. Relative frequencies: red 0.35, blue 0.15, green 0.5.

Scoring: 1 point for each part. In (c) give the point for 0.15 times 200.

Question 4: Fair cube (2 points)

(a) Faces greater than 4: 5 and 6. So $P = \frac{2}{6} = \frac{1}{3}$.

(b) Odd faces: 1, 3, 5. So $P = \frac{3}{6} = \frac{1}{2}$.

Scoring: 1 point for each part (fraction need not be simplified if correct).

Question 5: Missing probability (3 points)

(a) The probabilities add to 1: $0.5 + 0.25 + 0.15 = 0.9$, so $P(D) = 1 - 0.9 = 0.1$.

(b) $P(C \text{ or } D) = 0.15 + 0.1 = 0.25$.

(c) $0.25 \times 200 = 50$. About **50** times.

Scoring: 1 point for each part.

Question 6: Fair or not (3 points)

(a) The expected count is $\frac{1}{6} \times 30 = 5$ for each face.

(b) Differences: face 1: -2; face 2: +1; face 3: 0; face 4: -1; face 5: +2; face 6: 0. Faces **1 and 5** differ the most, by 2 each.

(c) Yes. Every count is within 2 of 5, which is normal variation for only 30 rolls.

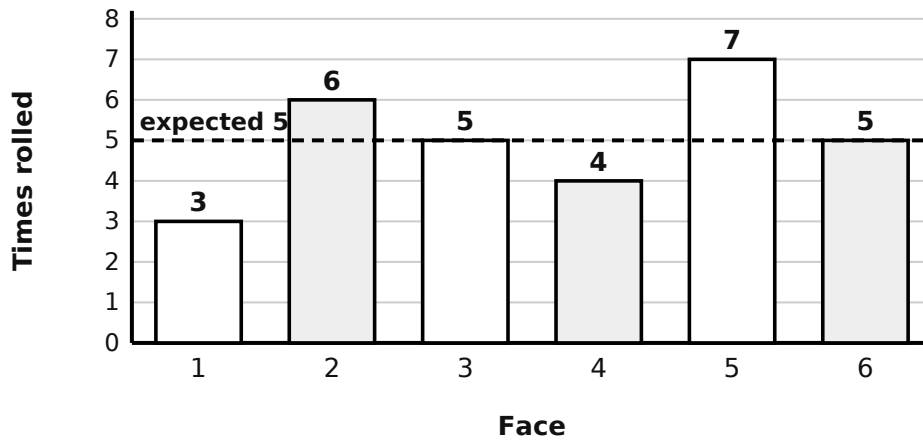


Figure. Observed counts and the expected count of 5.

Scoring: 1 point for 5; 1 point for faces 1 and 5 with the difference 2; 1 point for a reasonable conclusion with a reason.

Question 7: Tossing a cup (2 points)

(a) Up: $\frac{12}{80} = 0.15$. Down: $\frac{36}{80} = 0.45$. Side: $\frac{32}{80} = 0.4$. Check: $0.15 + 0.45 + 0.4 = 1$.

(b) $0.4 \times 300 = 120$. About **120** side landings.

Scoring: 1 point for the model; 1 point for the prediction.

Question 8: Bus schedule (2 points)

(a) $1 - \frac{3}{20} = \frac{17}{20}$. The probability of being on time is $\frac{17}{20}$.

(b) $\frac{3}{20} \times 40 = 6$. She should expect about **6** late days.

Scoring: 1 point for each part.

Total
20 points