

Probability Models and Chance Experiments

Grade 7 math · Test Answer Key · Standards: 7.SP.C.5, 7.SP.C.6, 7.SP.C.7

The answer key gives each probability with its reasoning and a scoring guide. Accept equivalent fractions and decimals, and give credit for explanations that compare the observed counts with the expected counts.

Standards: 7.SP.C.5, 7.SP.C.6, 7.SP.C.7 · **Level:** Grade 7

Question 1 Describe the likelihood (2 points)

- a. **Unlikely**, because 0.03 is close to 0.
- b. **0**; the event is impossible.

Scoring: 1 point for each part.

Question 2 Bag of marbles (3 points)

- a. Total 15. $P(\text{purple}) = 4/15 = \mathbf{4/15}$.
- b. $P(\text{not orange}) = 10/15 = \mathbf{2/3}$.
- c. $P(\text{green or orange}) = 11/15 = \mathbf{11/15}$.

Scoring: 1 point for each part.

Question 3 Thumbtack trials (2 points)

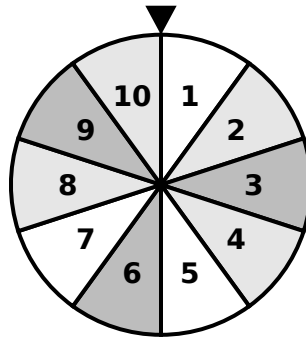
- a. $32 \div 50 = \mathbf{0.64}$.
- b. $0.64 \times 300 = \mathbf{192}$.

Scoring: 1 point for each part.

Question 4 Spinner probabilities (3 points)

- a. The multiples of 3 are 3, 6, 9: **3/10**.
- b. The numbers greater than 7 are 8, 9, 10: **3/10**.
- c. 9 outcomes are not 5: **9/10**.

Scoring: 1 point for each part.



Shaded: 3, 6, 9.

Question 5 Probability model table (3 points)

- a. $1 - 0.1 - 0.3 - 0.4 = \mathbf{0.2}$.
- b. $0.1 + 0.3 = \mathbf{0.4}$.
- c. $0.4 \times 150 = \mathbf{60}$.

Scoring: 1 point for each part.

Question 6 Die experiment (3 points)

- a. $12 \div 60 = \mathbf{0.2}$.
- b. $\mathbf{1/6}$, about 0.167.
- c. A fair die is expected to show each number 10 times in 60 rolls. The counts are all between 8 and 12, so the data are **consistent with a fair die**.

Scoring: 1 point for each part.

Question 7 Compare with the model (2 points)

- a. $1/4 \times 80 = \mathbf{20}$.
- b. 31 is 11 more than 20, a large gap for 80 spins, so the model is **probably not correct**; red seems more likely than $1/4$.

Scoring: 1 point for each part.

Question 8 Write a model (2 points)

- a. $P(\text{blue}) = \mathbf{3/8}$, $P(\text{red}) = \mathbf{2/8} = \mathbf{1/4}$, $P(\text{yellow}) = \mathbf{3/8}$.
- b. $3/8 + 2/8 + 3/8 = 8/8 = 1$. $P(\text{not red}) = 1 - 1/4 = \mathbf{3/4}$.

Scoring: 1 point for each part.