

Probability Models and Chance Experiments

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

Name: _____ Date: _____ Class: _____

This test has 8 questions worth 20 points on probability, models and experiments. Allow 45 minutes, write probabilities as simplified fractions or decimals as shown in the question, and explain your reasoning when asked.

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

Time: 45 minutes · 8 questions · Total: 20 points · Calculator: as allowed by your teacher

Question 1 Describe the likelihood (2 points)

(a) An event has a probability of 0.03. Describe its likelihood. (1 point) (b) A bag holds only blue marbles. What is the probability of drawing a red marble? (1 point)

Question 2 Bag of marbles (3 points)

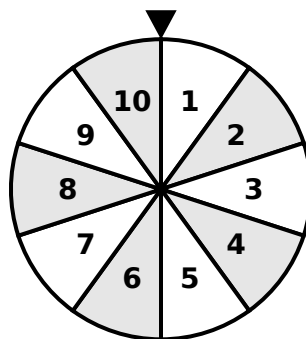
A bag holds 6 green, 4 purple and 5 orange marbles. One marble is drawn at random. (a) Find $P(\text{purple})$. (1 point) (b) Find $P(\text{not orange})$. (1 point) (c) Find $P(\text{green or orange})$. (1 point) Write each answer in simplest form.

Question 3 Thumbtack trials (2 points)

A thumbtack was tossed 50 times and landed point up 32 times. (a) Find the experimental probability of landing point up. (1 point) (b) Predict the number of point-up landings in 300 tosses. (1 point)

Question 4 Spinner probabilities (3 points)

The spinner has 10 equal sections.



Spinner numbered 1 to 10.

a. Find $P(\text{multiple of 3})$. (1 point)

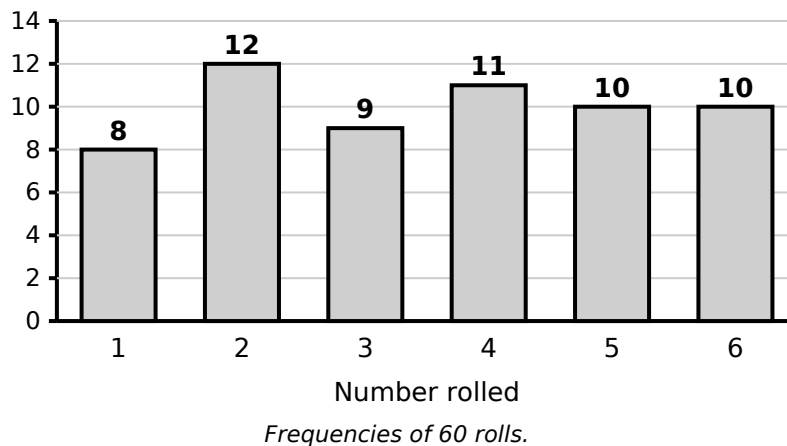
- b. Find $P(\text{greater than } 7)$. (1 point)
- c. Find $P(\text{not } 5)$. (1 point)

Question 5 Probability model table (3 points)

A probability model for a game has these probabilities: $P(A) = 0.1$, $P(B) = 0.3$, $P(C) = 0.4$ and D is the only other outcome. (a) Find $P(D)$. (1 point) (b) Find $P(A \text{ or } B)$. (1 point) (c) Predict how many times C occurs in 150 trials. (1 point)

Question 6 Die experiment (3 points)

A die was rolled 60 times.



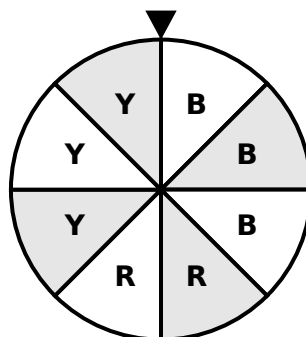
- a. Find the experimental probability of rolling a 2. (1 point)
- b. Find the theoretical probability of rolling a 2 with a fair die. (1 point)
- c. Do the data suggest the die is fair? Explain. (1 point)

Question 7 Compare with the model (2 points)

A spinner model says $P(\text{red}) = 1/4$. In 80 spins, red came up 31 times. (a) How many reds does the model predict? (1 point) (b) Is the model likely to be correct? Explain. (1 point)

Question 8 Write a model (2 points)

A fair spinner has 8 equal sections: 3 blue, 2 red and 3 yellow.



$B = \text{blue}$, $R = \text{red}$, $Y = \text{yellow}$.

(a) Write the probability model for blue, red and yellow. (1 point) (b) Show that the probabilities add to 1 and find $P(\text{not red})$. (1 point)