MATHEMATICS · GRADES 7-9

Experimental Probability

Difficulty level: Intermediate

Mathematics: Grades 7-9

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Overview of the concept

This is how you estimate the chance of something from actually trying it many times. Flip a coin a hundred times and the share of heads tells you the chance of heads, and testing how often a basketball player makes a free throw tells you their real shooting chance. The more trials you run, the closer your estimate gets to the truth. It is how you measure a chance you cannot work out from theory alone.



Rule

Experimental probability: the chance of an outcome is $P = \dfrac{\text{number of times it happened}}{\text{total number of trials}}$.

The more trials you run, the closer it gets to the true chance.

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Worked examples

EXAMPLE 1

Q **A coin is flipped 50 times and lands heads 28 times. Find the experimental P(heads).**

SOLUTION

Count the outcome: heads 28 times.

Count total trials: 50

Experimental P = $\frac{28}{50} = \frac{14}{25}$

EXAMPLE 2

Q **A die is rolled 60 times and a 6 appears 8 times. Find the experimental P(6).**

SOLUTION

Count the outcome: 6 appears 8 times.

Count total trials: 60

Experimental P = $\frac{8}{60} = \frac{2}{15}$

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Practice questions

1 A coin is flipped 80 times, and it lands on heads 46 times. Find the experimental probability of heads.

A $\frac{11}{20}$

B $\frac{23}{40}$

C $\frac{40}{23}$

D $\frac{23}{80}$

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2 Maya rolls a die 90 times, and a 6 comes up 21 times. Find the experimental probability of NOT rolling a 6.

A $\frac{23}{30}$

B $\frac{7}{30}$

C $\frac{30}{7}$

D $\frac{7}{90}$

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3 **A spinner has 4 equal sections: red, blue, green, and yellow. It is spun 40 times and lands on red 10 times. Is the experimental probability of red equal to the theoretical probability of red?**

- **A** Yes, both are $\frac{1}{4}$
- **B** No, the experimental probability is higher
- **C** No, the experimental probability is lower
- **D** Cannot tell from this data

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4 **A basketball player takes 20 free throws and makes 12 of them. How many did she miss?**

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5 Leo flips a coin 20 times and gets heads 12 times. What is the experimental probability of heads as a percentage?

- A 60%
- B 40%
- C 12%
- D 20%

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6 The experimental probability of drawing a blue ball is $\frac{1}{5}$. The ball was drawn 25 times, with the ball put back each time. How many times was a blue ball drawn?

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7 Ana rolls a die 12 times and never rolls a 3. Find the experimental probability of rolling a 3.

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8 A spinner is spun 50 times and lands on green 15 times. What is the experimental probability of landing on green as a decimal?

A 0.3

B 0.15

C 3.0

D 0.03

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9 A coin is flipped 100 times and lands heads 48 times. How many fewer heads than tails were there?

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10 A die is rolled 90 times and a 2 appears 18 times. About how many times would you expect a 2 in 450 rolls?

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ANSWER KEY

1. $\frac{23}{40}$

2. $\frac{23}{30}$

3. Yes, both are $\frac{1}{4}$

4. 8

5. 60%

6. 5

7. 0

8. 0.3

9. 4

10. 90

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