

Write and Compare Probabilities as Fractions, Decimals and Percents

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Printed: October 8, 2023 (PST)



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[Figure1]

A spinner is divided into four sections: green, blue, red and yellow. What is the **probability** of spinning the arrow and having it land in the green section? Write this probability as a fraction, decimal and as a percent.

In this concept, you will learn to write probabilities as fractions, decimals and percent.

Probabilities as Fractions, Decimals and Percents

Probabilities can be computed in terms of ratios. Since any ratio can be turned into a fraction, decimal, or percent, you can also turn any probability into a fraction, decimal, or percent.

For instance, when you toss a number cube, the probability of rolling a “3” is:

$$P(3) = \text{favorable outcomes: total outcomes}$$

$$P(3) = 1 : 6$$

The same probability can be written as a fraction simply by rewriting the two numbers in the ratio as the numerator and denominator of a fraction.

$$P(3) = \frac{1}{6}$$

This is the answer in fraction form.

How can this fraction be expressed as a decimal?

The fraction can be expressed as a decimal by dividing the numerator by the denominator.

$$\frac{1}{6} = \begin{array}{r} 0.1666 \\ \hline 6 \overline{)1.0000} \end{array}$$

The answer is 0.1666... or 0.167.

How can this decimal be expressed as a percent?

The decimal can be expressed as a percent by multiply the decimal by 100 since a percent is out of 100. Then, move the decimal point two places to the right to show the percent.

$$\% = 0.167 \times 100$$

$$\% = 16.7$$

The answer is 16.7%.

The decimal 0.167 is equal to 16.7%.

To summarize, the probability of rolling a 3 with a number cube is 1 out of 6 and can be expressed in the following forms.

Ratio	1:6
Fraction	$\frac{1}{6}$
Decimal	0.167
Percent	16.7%

Examples

Example 1

Earlier, you were given a problem about your spinner with the four colors. You have a spinner with the colors green, blue, red and yellow. You want to determine the probability of landing on green expressed as a fraction, a decimal, and a percent.

First, write the fraction.

Green is one out of four colors. Therefore the fraction is:

$$\frac{1}{4}$$

Next, write the decimal.

$$\frac{1}{4} = 4 \overline{)1.00}^{0.25}$$

Then, write the percent.

$$\begin{aligned} \% &= 0.25 \times 100 \\ \% &= 25 \end{aligned}$$

The answers are $\frac{1}{4}$, **0.25** and **25%**.

The probability of spinning the spinner and landing on green is $\frac{1}{4}$ or **0.25** or **25%**.

Example 2

Kelly is playing a game at a carnival. She threw four out of 9 rings onto pins. If you write this as a fraction you get $\frac{4}{9}$.

What is it as a decimal or as a percent?

First, divide 4 by 9 to create a decimal.

$$\frac{4}{9} = 9 \overline{)4.0000} \quad \begin{array}{r} 0.4444 \\ \hline \end{array}$$

The answer is 0.4444... or 0.44.

Next, change the decimal to a percent.

$$\begin{aligned} \% &= 0.44 \times 100 \\ \% &= 44 \end{aligned}$$

The answer is 44%.

The decimal 0.44 is equal to 44%.

Kelly's probability is about 44% or she hits the pins 44% of the time. The word "about" is used because the answer was rounded from the decimal to the percent.

Example 3

Write two out of five in fraction form.

$$\text{Two out of five} = \frac{2}{5}$$

Example 4

Write two out of five in decimal form.

$$\frac{2}{5} = 5 \overline{)2.0} \quad \begin{array}{r} 0.4 \\ \hline \end{array}$$

The answer is 0.4.

Example 5

Write two out of five in percent form.

$$\begin{aligned} \% &= 0.4 \times 100 \\ \% &= 40 \end{aligned}$$

The answer is 40%.

Review

Answer the questions below.

A bag has 6 red marbles, 5 blue marbles, 7 green marbles, 2 white marbles, and 5 yellow marbles. Find the probability of randomly picking out one of the following.

1. What is the probability in fraction form of choosing red marble?
2. What is the probability in decimal form of choosing red marble?
3. What is the probability of choosing red marble as a percent?
4. What is the probability in fraction form of choosing blue marble?
5. What is the probability in decimal form of choosing blue marble?
6. What is the probability of choosing blue marble as a percent?
7. What is the probability in fraction form of choosing green marble?
8. What is the probability in fraction form of choosing white marble?
9. What is the probability in decimal form of choosing green marble?
10. What is the probability in percent form of choosing a green or blue marble?
11. What is the probability in fraction form of choosing yellow marble?
12. What is the probability in decimal form of choosing yellow marble?
13. What is the probability of choosing yellow marble as a percent?
14. Which 3 marbles together have a 60 percent chance of being chosen?
15. Which 2 marbles together have a 48 percent chance of being chosen?
16. Which 3 marbles together have a 0.72 chance of being chosen?

Review (Answers)

To see the review answers, return to the [Table of Contents](#) and select 'Other Versions' or 'Resources'.

Resources


<https://www.ck12.org/flx/render/embeddedobject/167540>

Vocabulary

Language: English ▾

Term	Definition
Favorable Outcome	A favorable outcome is the outcome that you are looking for in an experiment.
Probability	Probability is the chance that something will happen. It can be written as a fraction, decimal or percent.

1.0 REFERENCES

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