Assume that a fair die is rolled. The sample space is $\{1, 2, 3, 4, 5, 6\}$, and all the outcomes are equally likely. Find $P(\text{Multiple of } 2)$. Express your answer in exact form.

$P(\text{Multiple of } 2) = \frac{1}{2}$

Assume that a fair die is rolled. The sample space is $\{1, 2, 3, 4, 5, 6\}$, and all the outcomes are equally likely. Find $P(\text{Greater than } 5)$. Write your answer as a fraction or whole number.

$P(\text{Greater than } 5) = \frac{1}{6}$

Job satisfaction: In a poll, 417 out of 1729 people said that their main satisfaction in life comes from work.

Part 1 of 2

(a) What is the probability that a person who was polled finds his or her main satisfaction in life from work? Round your answer to four decimal places.

The probability that a person who was polled finds his or her main satisfaction in life from work is 0.2412.

Part: 2 / 2

Part 2 of 2

(b) Interpret this probability by estimating the percentage of all people whose main satisfaction in life comes from their work. Round your answer to two decimal places.

We estimate 24.12 % of all people find their main satisfaction in life comes from work.

A coin flip: A fair coin is tossed three times. The outcomes of the three tosses are recorded. Round your answers to four decimal places if necessary.

Part 1 of 3

Assuming the outcomes to be equally likely, find the probability that all three tosses are "Heads."

The probablility that all three tosses are "Heads" is 0.1250.

Part 2 of 3

Assuming the outcomes to be equally likely, find the probability that the tosses are all the same.

The probablility that the tosses are the same is 0.2500.

Part: 3 / 3

Part 3 of 3

Assuming the outcomes to be equally likely, find the probability that exactly two of the three tosses is "Heads."

The probablility that exactly two of the three tosses is "Heads" is 0.375.

Empirical Method: A coin is tossed 500 times and comes up heads 275 times. Use the Empirical Method to approximate the probability that the coin comes up heads. Round your answer to four decimal places as necessary.

Using the Empirical Method the probability is approximately 0.5500.

Pitching: During a recent season, pitcher Clayton Kershaw threw 2574 pitches. Of these, 1287 were fastballs, 26 were changeups, 386 were curveballs, and 875 were sliders. Round the answers to four decimal places as needed.

(a) What is the probability that Clayton Kershaw throws a fastball?

(b) What is the probability that Clayton Kershaw throws a breaking ball (curveball or slider)?

Part 1 of 2

The probability that Clayton Kershaw throws a fastball is 0.5000.

Alternate Answer:

The probability that Clayton Kershaw throws a fastball is 0.5.

Part: **2 / 2**

Part 2 of 2

The probability that Clayton Kershaw throws a breaking ball (curveball or slider) is 0.4899.

Risky drivers: An automobile insurance company divides customers into three categories: good risks, medium risks, and poor risks. Assume that of a total of 11,192 customers, 7767 are good risks, 2480 are medium risks, and 945 are poor risks. As part of an audit, one customer is chosen at random. Round your answers to four decimal places if necessary.

Part 1 of 2

(a) What is the probability that the customer is a good risk?

The probability that the customer is a good risk is 0.6940.

Part: 2 / 2

Part 2 of 2

(b) What is the probability that the customer is not a poor risk?

The probability that the customer is not a poor risk is 0.9156.

Roulette: A Nevada roulette wheel has 38 pockets. Eighteen of them are red, eighteen are black, and two are green. Each time the wheel is spun, a ball lands in one of the pockets, and each pocket is equally likely.

Part 1 of 2

(a) What is the probability that the ball lands in a red pocket? Round your answer to four decimal places.

The probability that the ball lands in a red pocket is 0.4737.

Part: 2 / 2

Part 2 of 2

(b) If you bet on red on every spin of the wheel, you will lose more than half the time in the long run. Explain why this is so. Round your answer to two decimal places.

You will lose more than half the time in the long run if you always bet on red because the law of large numbers ▼ says that in the long run, the percentage of the time you lose will approach 52.63 %.

Get an education: A survey asked 32,126 people how much confidence they had in educational institutions. The results were as follows. Round your answers to four decimal places if necessary.

Response	Number
A great deal	10,022
Some	17,813
Hardly any	4291
Total	32,126

Send data to Excel

Part 1 of 3

(a) What is the probability that a sampled person has either some or hardly any confidence in educational institutions?

The probability that a sampled person has either some or hardly any confidence in educational institutions is 0.6880.

Part 2 of 3

(b) Assume this is a simple random sample from a population. Use the Empirical Method to estimate the probability that a person has hardly any confidence in educational institutions.

Using the Empirical Method the probability is approximately 0.1336.

Part: 3 / 3

Part 3 of 3

(c) If we use a cutoff of 0.05, is it unusual for someone to have a great deal of confidence in educational institutions?

Based on a cutoff of 0.05, it is not ▼ unusual for someone to have a great deal of confidence in educational institutions.

Hospital visits: According to a health agency, there were 409,675 hosital visits for asthma–related illnesses in a recent year. The age distribution was as follows. Round your answers to four decimal places if necessary.

Age Range	Number
Less than 1 year	7861
1-17	103,030
18-44	79,651
45-64	121,722
65-84	80,660
85 and up	16,751
Total	409,675

Send data to Excel

Part 1 of 3

(a) What is the probability that an asthma patient is between 65 and 84 years old?

The probability that an asthma patient is between 65 and 84 years old is 0.1969.

Part 2 of 3

(b) What is the probability than an asthma patient is 85 years old or older?

The probability that an asthma patient is 85 years old or older 0.0409.

Part: 3 / 3

Part 3 of 3

(c) Using a cutoff of 0.05, is it unusual for an asthma patient to be less than 1 year old?

Based on a cutoff of 0.05, it is ▼ unusual for an asthma patient to be less than 1 year old.

A coin flip: A fair coin is tossed three times. The outcomes of the three tosses are recorded. Round your answers to four decimal places if necessary.

Part 1 of 3

Assuming the outcomes to be equally likely, find the probability that all three tosses are "Heads."

The probablility that all three tosses are "Heads" is 0.1250.

Example

SAMPLE QUESTION

A coin flip: A fair coin is tossed three times. The outcomes of the three tosses are recorded. Round your answers to four decimal places if necessary.

List all eight outcomes in the sample space.

(a) Assuming the outcomes to be equally likely, find the probability that all three tosses are "Tails."

(b) Assuming the outcomes to be equally likely, find the probability that the tosses are all the same.

(c) Assuming the outcomes to be equally likely, find the probability that exactly two of the three tosses is "Tails."

EXPLANATION

List all eight outcomes in the sample space.

Each coin toss has two possible outcomes. Let H represents "Heads" and T represents "Tails". We can construct the sample space using the following table:

Toss 1	**Toss** 2	**Toss** 3
H	H	H
H	H	T
H	T	H
H	T	T
T	H	H
T	H	T
T	T	H
T	T	T

Reading across the lines, we find the sample space to be {HHH, HHT, HTH, HTT, THH, THT, TTH, TTT}.

(a) Assuming the outcomes to be equally likely, find the probability that all three tosses are "Tails."

Of the eight equally likely outcomes, only the outcome TTT corrresponds to having all three tosses "Tails." Therefore,

$P(\text{All the answers are "Tails"}) = \frac{1}{8} = 0.1250$

(b) Assuming the outcomes to be equally likely, find the probability that the tosses are all the same.

Of the eight equally likely outcomes, the two outcomes HHH and TTT correspond to having all the tosses the same. Therefore,

$P(\text{All the tosses are the same}) = \frac{2}{8} = 0.2500$

(c) Assuming the outcomes to be equally likely, find the probability that exactly two of the three tosses is "Tails."

Of the eight equally likely outcomes, the three outcomes TTH, THT, and HTT correspond to having exactly two of the three tosses "Tails." Therefore,

$P(\text{Exactly two of the three tosses is "Tails"}) = \frac{3}{8} = 0.3750$

ANSWER

Part 1 of 3

0.1250

Part 2 of 3

0.2500

Part 3 of 3

0.3750

Pitching: During a recent season, pitcher Clayton Kershaw threw 2574 pitches. Of these, 1287 were fastballs, 26 were changeups, 386 were curveballs, and 875 were sliders. Round the answers to four decimal places as needed.

(a) What is the probability that Clayton Kershaw throws a fastball?

(b) What is the probability that Clayton Kershaw throws a breaking ball (curveball or slider)?

Part 1 of 2

Example

SAMPLE QUESTION

Pitching: During a recent season, pitcher Clayton Kershaw threw 2544 pitches. Of these, 1323 were fastballs, 25 were changeups, 407 were curveballs, and 789 were sliders. Round the answers to four decimal places as needed.

(a) What is the probability that Clayton Kershaw throws a changeup?

(b) What is the probability that Clayton Kershaw throws a breaking ball (curveball or slider)?

EXPLANATION

(a) What is the probability that Clayton Kershaw throws a changeup?

The sample space consists of the 2544 pitches thrown during the recent season. Of these, 25 were changeups, so the probability that the pitch is a changeup is

$$P(\text{changeup}) = \frac{25}{2544} = 0.0098$$

(b) What is the probability that Clayton Kershaw throws a breaking ball (curveball or slider)?

The sample space consists of the 2544 pitches thrown during the recent season. Of these, 407 were curveballs and 789 were sliders, so the probability that the pitch is a breaking ball is

$$\begin{aligned} P(\text{breaking ball}) &= P(\text{curveball}) + P(\text{slider}) \\ &= \frac{407}{2544} + \frac{789}{2544} \\ &= \frac{1196}{2544} \\ &= 0.4701 \end{aligned}$$

ANSWER

Part 1 of 2

The probability that Clayton Kershaw throws a changeup is 0.0098.

Part 2 of 2

The probability that Clayton Kershaw throws a breaking ball (curveball or slider) is 0.4701.

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