

Question ID fef1f5c9

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Problem-Solving and Data Analysis	Probability and conditional probability	<div><div></div><div></div><div></div></div>

ID: fef1f5c9

For a particular machine that produces beads, **29** out of every **100** beads it produces have a defect. A bead produced by the machine will be selected at random. What is the probability of selecting a bead that has a defect?

- A. $\frac{1}{2,900}$
- B. $\frac{1}{29}$
- C. $\frac{29}{100}$
- D. $\frac{29}{10}$

ID: fef1f5c9 Answer

Correct Answer: C

Rationale

Choice C is correct. It's given that 29 out of every 100 beads that the machine produces have a defect. It follows that if the machine produces k beads, then the number of beads that have a defect is $\frac{29}{100}k$, for some constant k . If a bead produced by the machine will be selected at random, the probability of selecting a bead that has a defect is given by the number of beads with a defect, $\frac{29}{100}k$, divided by the number of beads produced by the machine, k . Therefore, the probability of selecting a bead that has a defect is $\frac{\frac{29}{100}k}{k}$, or $\frac{29}{100}$.

Choice A is incorrect and may result from conceptual or computational errors.

Choice B is incorrect and may result from conceptual or computational errors.

Choice D is incorrect and may result from conceptual or computational errors.

Question Difficulty: Easy

Question ID 5aba7ae0

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Problem-Solving and Data Analysis	Probability and conditional probability	<div><div></div><div></div><div></div></div>

ID: 5aba7ae0

−13, 4, 23

A data set of three numbers is shown. If a number from this data set is selected at random, what is the probability of selecting a negative number?

- A. 0
- B. $\frac{1}{3}$
- C. $\frac{2}{3}$
- D. 1

ID: 5aba7ae0 Answer

Correct Answer: B

Rationale

Choice B is correct. If a number from the data set is selected at random, the probability of selecting a negative number is the count of negative numbers in the data set divided by the total count of numbers in the data set. It's given that a data set of three numbers is shown. It follows that the total count of numbers in the data set is 3. In the data set shown, -13 is the only negative number. It follows that the count of negative numbers in the data set is 1. Therefore, if a number from the data set is selected at random, the probability of selecting a negative number is $\frac{1}{3}$.

Choice A is incorrect. This is the probability of selecting a negative number from a data set that doesn't contain any negative numbers.

Choice C is incorrect. This is the probability of selecting a positive number, not a negative number, from the data set.

Choice D is incorrect. This is the probability of selecting a negative number from a data set that contains only negative numbers.

Question Difficulty: Easy

Question ID 89b3ea02

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Problem-Solving and Data Analysis	Probability and conditional probability	<div><div></div><div></div><div></div></div>

ID: 89b3ea02

A band with **45** members has **11** members who play saxophone. If one band member is selected at random, what is the probability of selecting a band member who plays saxophone?

- A. $\frac{1}{45}$
- B. $\frac{11}{45}$
- C. $\frac{34}{45}$
- D. $\frac{45}{45}$

ID: 89b3ea02 Answer

Correct Answer: B

Rationale

Choice B is correct. The probability of an event occurring is the ratio of the number of favorable outcomes to the total number of possible outcomes. It's given that there are 45 band members, which is the total number of possible outcomes. It's also given that there are 11 band members who play saxophone. Therefore, the number of favorable outcomes is 11. Thus, the probability of selecting a band member who plays saxophone is $\frac{11}{45}$.

Choice A is incorrect and may result from conceptual or calculation errors.

Choice C is incorrect. This is the probability of selecting a band member who does not play saxophone.

Choice D is incorrect and may result from conceptual or calculation errors.

Question Difficulty: Easy

Question ID aae6aebd

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Problem-Solving and Data Analysis	Probability and conditional probability	<div><div></div><div></div><div></div></div>

ID: aae6aebd

There are **20** buttons in a bag: **8** white buttons, **2** orange buttons, and **10** brown buttons. If one of these buttons is selected at random, what is the probability of selecting a white button?

- A. $\frac{2}{20}$
- B. $\frac{8}{20}$
- C. $\frac{10}{20}$
- D. $\frac{12}{20}$

ID: aae6aebd Answer

Correct Answer: B

Rationale

Choice B is correct. It’s given that there are 20 buttons in a bag and 8 of the buttons are white. If one button from the bag is selected at random, the probability of selecting a white button is the number of white buttons in the bag divided by the total number of buttons in the bag. Therefore, if one button from the bag is selected at random, the probability of selecting a white button is $\frac{8}{20}$.

Choice A is incorrect. This is the probability of selecting an orange button from the bag.

Choice C is incorrect. This is the probability of selecting a brown button from the bag.

Choice D is incorrect. This is the probability of selecting a button that isn't white from the bag.

Question Difficulty: Easy

Question ID 59b985a2

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Problem-Solving and Data Analysis	Probability and conditional probability	<div><div></div><div></div><div></div></div>

ID: 59b985a2

Each face of a fair ~~14~~-sided die is labeled with a number from **1** through ~~14~~, with a different number appearing on each face. If the die is rolled one time, what is the probability of rolling a **2**?

- A. $\frac{1}{14}$
- B. $\frac{2}{14}$
- C. $\frac{12}{14}$
- D. $\frac{13}{14}$

ID: 59b985a2 Answer

Correct Answer: A

Rationale

Choice A is correct. The total number of possible outcomes for rolling a fair 14-sided die is 14. The number of possible outcomes for rolling a 2 is 1. The probability of rolling a 2 is the number of possible outcomes for rolling a 2 divided by the total number of possible outcomes, or $\frac{1}{14}$.

Choice B is incorrect. This is the probability of rolling a number no greater than 2.

Choice C is incorrect. This is the probability of rolling a number greater than 2.

Choice D is incorrect. This is the probability of rolling a number other than 2.

Question Difficulty: Easy

Question ID c17aedbe

Assessment	Test	Domain	Skill	Difficulty
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ID: c17aedbe

Each of **157** gemstones can be classified as one of three classifications, as shown in the frequency table.

Classification	Frequency
color X	119
color Y	3
color Z	35

If one of the gemstones is selected at random, what is the probability of selecting a gemstone of color Y?

- A. $\frac{3}{157}$
- B. $\frac{35}{157}$
- C. $\frac{119}{157}$
- D. $\frac{154}{157}$

ID: c17aedbe Answer

Correct Answer: A

Rationale

Choice A is correct. If one of the gemstones is selected at random, the probability of selecting a gemstone of color Y is equal to the number of gemstones of color Y divided by the total number of gemstones. According to the table, there are 3 gemstones of color Y, and it's given that the total number of gemstones is 157. Therefore, if one of the gemstones is selected at random, the probability of selecting a gemstone of color Y is $\frac{3}{157}$.

Choice B is incorrect. This is the probability of selecting a gemstone of color Z.

Choice C is incorrect. This is the probability of selecting a gemstone of color X.

Choice D is incorrect. This is the probability of selecting a gemstone that's not of color Y.

Question Difficulty: Easy

Question ID ce4fa697

Assessment	Test	Domain	Skill	Difficulty
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ID: ce4fa697

Each rock in a collection of **70** rocks was classified as either igneous, metamorphic, or sedimentary, as shown in the frequency table.

Classification	Frequency
igneous	10
metamorphic	33
sedimentary	27

If one of these rocks is selected at random, what is the probability of selecting a rock that is igneous?

- A. $\frac{10}{27}$
- B. $\frac{10}{33}$
- C. $\frac{10}{60}$
- D. $\frac{10}{70}$

ID: ce4fa697 Answer

Correct Answer: D

Rationale

Choice D is correct. If one of the rocks in the collection is selected at random, the probability of selecting a rock that is igneous is equal to the number of igneous rocks in the collection divided by the total number of rocks in the collection. According to the table, there are 10 igneous rocks in the collection, and it's given that there's a total of 70 rocks in the collection. Therefore, if one of the rocks in the collection is selected at random, the probability of selecting a rock that is igneous is $\frac{10}{70}$.

Choice A is incorrect. This is the number of igneous rocks in the collection divided by the number of sedimentary rocks in the collection, not divided by the total number of rocks in the collection.

Choice B is incorrect. This is the number of igneous rocks in the collection divided by the number of metamorphic rocks in the collection, not divided by the total number of rocks in the collection.

Choice C is incorrect. This is the number of igneous rocks in the collection divided by the number of rocks in the collection that aren't igneous, not divided by the total number of rocks in the collection.

Question Difficulty: Easy

Question ID 275bc8e8

Assessment	Test	Domain	Skill	Difficulty
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ID: 275bc8e8

The table gives the distribution of votes for a new school mascot and grade level for 80 students.

Mascot	Grade level			
	Sixth	Seventh	Eighth	Total
Badger	4	9	9	22
Lion	9	2	9	20
Longhorn	4	6	4	14
Tiger	6	9	9	24
Total	23	26	31	80

If one of these students is selected at random, what is the probability of selecting a student whose vote for new mascot was for a lion?

- A. $\frac{1}{9}$
- B. $\frac{1}{5}$
- C. $\frac{1}{4}$
- D. $\frac{2}{3}$

ID: 275bc8e8 Answer

Correct Answer: C

Rationale

Choice C is correct. If one of these students is selected at random, the probability of selecting a student whose vote for the new mascot was for a lion is given by the number of votes for a lion divided by the total number of votes. The given table indicates that the number of votes for a lion is 20 votes, and the total number of votes is 80 votes. The table gives the distribution of votes for 80 students, and the table shows a total of 80 votes were counted. It follows that each of the 80 students voted exactly once. Thus, the probability of selecting a student whose vote for the new mascot was for a lion is $\frac{20}{80}$, or $\frac{1}{4}$.

Choice A is incorrect and may result from conceptual or computational errors.

Choice B is incorrect and may result from conceptual or computational errors.

Choice D is incorrect and may result from conceptual or computational errors.

Question Difficulty: Easy

Question ID 3ce69ff2

Assessment	Test	Domain	Skill	Difficulty
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ID: 3ce69ff2

On a street with **7** houses, **2** houses are blue. If a house from this street is selected at random, what is the probability of selecting a house that is blue?

- A. $\frac{1}{7}$
- B. $\frac{2}{7}$
- C. $\frac{5}{7}$
- D. $\frac{7}{7}$

ID: 3ce69ff2 Answer

Correct Answer: B

Rationale

Choice B is correct. If a house from the street is selected at random, the probability of selecting a house that is blue is equal to the number of houses on the street that are blue divided by the total number of houses on the street. Since there are 2 blue houses on a street with 7 total houses, the probability of selecting a house that is blue from this street is $\frac{2}{7}$.

Choice A is incorrect. This is the probability of selecting a house that is blue from a street on which 1 of the 7 houses is blue.

Choice C is incorrect. This is the probability of selecting a house that is not blue from this street.

Choice D is incorrect. This is the probability of selecting a house that is blue from a street on which all the houses are blue.

Question Difficulty: Easy