

Question ID f57616fa

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Probability and conditional probability	Hard

ID: f57616fa

	Site A	Site B	Total
Tulip	35	15	50
Daffodil	31	21	52
Total	66	36	102

The table shows the distribution of two types of flowers at two different sites. If a flower represented in the table is selected at random, what is the probability of selecting a flower from site A, given that the flower is a tulip? (Express your answer as a decimal or fraction, not as a percent.)

ID: f57616fa Answer

Correct Answer: 0.7, 7/10

Rationale

The correct answer is $\frac{35}{50}$. Based on the table, there are a total of **50** tulips, and **35** of these tulips are from site A. The probability of selecting at random a flower from site A, given that the flower is a tulip, is equal to the number of tulips from site A divided by the total number of tulips, which can be written as $\frac{35}{50}$, or $\frac{7}{10}$. Note that 35/50, 7/10, and .7 are examples of ways to enter a correct answer.

Question Difficulty: Hard

Question ID 9b0fb532

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Probability and conditional probability	Hard

ID: 9b0fb532

A grove has **6** rows of birch trees and **5** rows of maple trees. Each row of birch trees has **8** trees **20** feet or taller and **6** trees shorter than **20** feet. Each row of maple trees has **9** trees **20** feet or taller and **7** trees shorter than **20** feet. A tree from one of these rows will be selected at random. What is the probability of selecting a maple tree, given that the tree is **20** feet or taller?

- A. $\frac{9}{164}$
- B. $\frac{3}{10}$
- C. $\frac{15}{31}$
- D. $\frac{9}{17}$

ID: 9b0fb532 Answer

Correct Answer: C

Rationale

Choice C is correct. If a tree from one of these rows is selected at random, the probability of selecting a maple tree, given that the tree is **20** feet or taller, is equal to the number of maple trees that are **20** feet or taller divided by the total number of trees that are **20** feet or taller. It's given that there are **6** rows of birch trees, and each row of birch trees has **8** trees that are **20** feet or taller. This means that there are a total of **6(8)**, or **48**, birch trees that are **20** feet or taller. It's given that there are **5** rows of maple trees, and each row of maple trees has **9** trees that are **20** feet or taller. This means that there are a total of **5(9)**, or **45**, maple trees that are **20** feet or taller. It follows that there are a total of **48 + 45**, or **93**, trees that are **20** feet or taller. Therefore, the probability of selecting a maple tree, given that the tree is **20** feet or taller, is $\frac{45}{93}$, or $\frac{15}{31}$.

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

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

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

Question Difficulty: Hard

Question ID 132aefb3

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Probability and conditional probability	Hard

ID: 132aefb3

The table summarizes the distribution of age and assigned group for **90** participants in a study.

	0–9 years	10–19 years	20+ years	Total
Group A	5	17	8	30
Group B	6	8	16	30
Group C	19	5	6	30
Total	30	30	30	90

One of these participants will be selected at random. What is the probability of selecting a participant from group A, given that the participant is at least 10 years of age?

- A. $\frac{5}{18}$
- B. $\frac{5}{12}$
- C. $\frac{17}{30}$
- D. $\frac{5}{6}$

ID: 132aefb3 Answer

Correct Answer: B

Rationale

Choice B is correct. Since the participant will be selected at random, the probability of selecting a participant from group A, given that the participant is at least **10** years of age, is equal to the number of participants from group A who are at least **10** years of age divided by the total number of participants who are at least **10** years of age. Based on the table, in group A, there are **17** participants who are **10–19** years of age and **8** participants who are **20+** years of age. Therefore, there are a total of **17 + 8**, or **25**, participants in group A who are at least **10** years of age. Based on the table, of the total number of participants, there are **30** participants who are **10–19** years of age and **30** participants who are **20+** years of age. Therefore, a total of **30 + 30**, or **60**, of the participants are at least **10** years of age. Thus, the probability of selecting a participant from group A, given that the participant is at least **10** years of age, is $\frac{25}{60}$, or $\frac{5}{12}$.

Choice A is incorrect. This is the number of participants from group A who are at least **10** years of age divided by the total number of participants, rather than divided by the number of participants who are at least **10** years of age.

Choice C is incorrect. This is the probability of randomly selecting a participant from group A, given that the participant is **10–19** years of age, rather than given that the participant is at least **10** years of age.

Choice D is incorrect. This is the probability of randomly selecting a participant who is at least **10** years of age, given that the participant is in group A.

Question ID 91ac409a

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Probability and conditional probability	Hard

ID: 91ac409a

The table summarizes the distribution of age and assigned group for **90** participants in a study.

	0–9 years	10–19 years	20+ years	Total
Group A	7	14	9	30
Group B	6	4	20	30
Group C	17	12	1	30
Total	30	30	30	90

One of these participants will be selected at random. What is the probability of selecting a participant from group A, given that the participant is at least **10** years of age? (Express your answer as a decimal or fraction, not as a percent.)

ID: 91ac409a Answer

Correct Answer: .3833, 23/60

Rationale

The correct answer is $\frac{23}{60}$. It's given that one of the participants will be selected at random. The probability of selecting a participant from group A given that the participant is at least **10** years of age is the number of participants in group A who are at least **10** years of age divided by the total number of participants who are at least **10** years of age. The table shows that in group A, there are **14** participants who are **10–19** years of age and **9** participants who are **20+** years of age. Therefore, there are **14 + 9**, or **23**, participants in group A who are at least **10** years of age. The table also shows that there are a total of **30** participants who are **10–19** years of age and **30** participants who are **20+** years of age. Therefore, there are a total of **30 + 30**, or **60**, participants who are at least **10** years of age. It follows that the probability of selecting a participant from group A given that the participant is at least **10** years of age is $\frac{23}{60}$. Note that 23/60, .3833, and 0.383 are examples of ways to enter a correct answer.

Question Difficulty: Hard

Question ID 7007be56

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Inference from sample statistics and margin of error	Easy

ID: 7007be56

Scott selected **20** employees at random from all **400** employees at a company. He found that **16** of the employees in this sample are enrolled in exactly three professional development courses this year. Based on Scott’s findings, which of the following is the best estimate of the number of employees at the company who are enrolled in exactly three professional development courses this year?

- A. **4**
- B. **320**
- C. **380**
- D. **384**

ID: 7007be56 Answer

Correct Answer: B

Rationale

Choice B is correct. It’s given that from the sample of **20** employees at the company, **16** of the employees are enrolled in exactly three professional development courses this year. Since $\left(\frac{16}{20}\right)$ is equal to **0.80**, or $\frac{80}{100}$, it follows that **80%** of the employees in the sample are enrolled in exactly three professional development courses this year. Therefore, the best estimate for the percentage of employees at the company who are enrolled in exactly three professional development courses this year is **80%**. It’s given that there are a total of **400** employees at the company. Therefore, the best estimate of the number of employees at the company who are enrolled in exactly three professional development courses this year is $\left(\frac{80}{100}\right)(400)$, or **320**.

Choice A is incorrect. This is the number of employees from the sample who aren't enrolled in exactly three professional development courses this year.

Choice C is incorrect. This is the number of employees who weren't selected for the sample.

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

Question Difficulty: Easy

Question ID 88689c52

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Inference from sample statistics and margin of error	Easy

ID: 88689c52

A company designs and makes handbags. To estimate the mean weight of the handbags made by the company on a particular day, a sample of the handbags made by the company on that day was selected at random. Based on the sample, it is estimated that the mean weight of all handbags made by the company on that day is **27.8 ounces (oz)**, with an associated margin of error of **0.02 oz**. Based on this estimate and associated margin of error, which of the following is the most plausible conclusion?

- A. The mean weight of all handbags made by the company on that day is between **27.78 oz** and **27.82 oz**.
- B. The actual weights of all handbags made by the company on that day are between **27.78 oz** and **27.82 oz**.
- C. The actual weights of all handbags from the sample are between **27.78 oz** and **27.82 oz**.
- D. The mean weight of all handbags made by the company on that day is **27.8 oz**.

ID: 88689c52 Answer

Correct Answer: A

Rationale

Choice A is correct. It's given that the estimated mean weight of all handbags made by the company on a particular day is **27.8 oz**, with an associated margin of error of **0.02 oz**. It follows that plausible values for the mean weight are between **(27.8 – 0.02) oz** and **(27.8 + 0.02) oz**. Therefore, the most plausible conclusion is that the mean weight of all handbags made by the company on that day is between **27.78 oz** and **27.82 oz**.

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

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

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

Question Difficulty: Easy

Question ID 37ff191d

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Inference from sample statistics and margin of error	Easy

ID: 37ff191d

An analyst collected data on the price of a carton of grape tomatoes at **30** locations selected at random in Utah. The mean price of a carton of grape tomatoes in Utah was estimated to be **\$4.23**, with an associated margin of error of **\$0.08**. Which of the following is a plausible statement about the mean price of a carton of grape tomatoes for all locations that sell this product in Utah?

- A. It is between **\$4.15** and **\$4.31**.
- B. It is either less than **\$4.15** or greater than **\$4.31**.
- C. It is less than **\$4.15**.
- D. It is greater than **\$4.31**.

ID: 37ff191d Answer

Correct Answer: A

Rationale

Choice A is correct. It's given that the mean price of a carton of grape tomatoes in Utah was estimated to be **\$4.23**, with an associated margin of error of **\$0.08**. It follows that plausible values for this mean price are between **\$4.23 – \$0.08** and **\$4.23 + \$0.08**. Therefore, it's plausible that the mean price of a carton of grape tomatoes for all locations that sell this product in Utah is between **\$4.15** and **\$4.31**.

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

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

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

Question Difficulty: Easy

Question ID 9cbbe96d

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Inference from sample statistics and margin of error	Easy

ID: 9cbbe96d

There are **55** students in Spanish club. A sample of the Spanish club students was selected at random and asked whether they intend to enroll in a new study program. Of those surveyed, **20%** responded that they intend to enroll in the study program. Based on this survey, which of the following is the best estimate of the total number of Spanish club students who intend to enroll in the study program?

- A. **11**
- B. **20**
- C. **44**
- D. **55**

ID: 9cbbe96d Answer

Correct Answer: A

Rationale

Choice A is correct. It’s given that **20%** of the students surveyed responded that they intend to enroll in the study program. Therefore, the proportion of students in Spanish club who intend to enroll in the study program, based on the survey, is **0.20**. Since there are **55** total students in Spanish club, the best estimate for the total number of these students who intend to enroll in the study program is **55(0.20)**, or **11**.

Choice B is incorrect. This is the best estimate for the percentage, rather than the total number, of students in Spanish club who intend to enroll in the study program.

Choice C is incorrect. This is the best estimate for the total number of Spanish club students who do not intend to enroll in the study program.

Choice D is incorrect. This is the total number of students in Spanish club.

Question Difficulty: Easy