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Percentages (key)

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Question ID bd90f87e

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Percentages	■□□

ID: bd90f87e

A table of the US minimum wage for 6 different years is shown below.

Year	US minimum wage (dollars per hour)
1960	1.00
1970	1.60
1980	3.10
1990	3.80
2000	5.15
2010	7.25

What was the percent increase of the minimum wage from 1960 to 1970?

A. 30%

B. 60%

C. 62.5%

D. 120%

ID: bd90f87e Answer

Correct Answer: B

Rationale

Choice B is correct. According to the table, the minimum wage in 1960 was $1.00 per hour, and in 1970 it was $1.60 per hour. The percentage change is therefore $100\left(\frac{1.60-1.00}{1.00}\right)=60\%$.

Choice A is incorrect and may result from averaging the two wages before calculating the percentage change.

Choice C is incorrect. This is the 1960 wage expressed as a percentage of the 1970 wage, not the percentage

change between the two. Choice D is incorrect and may result from a calculation error.

Question Difficulty: Easy

Question ID 8705ecba

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Percentages	■□□

ID: 8705ecba

The cost of a certain shirt is $20 before a 5% sales tax is added. What is the total cost, including sales tax, to purchase the shirt?

A. $20.05

B. $20.50

C. $21.00

D. $25.00

ID: 8705ecba Answer

Correct Answer: C

Rationale

Choice C is correct. The total cost to purchase the shirt is the $20 cost of the shirt plus the 5% sales tax. The value of the 5% sales tax on the $20 shirt is equivalent to $(0.05)(\$20)$, or $1. Therefore, the total cost to purchase the shirt is $\$20 + \$1$, or $21.

Choice A is incorrect and may result from neglecting to multiply by $20 when finding the value of the sales tax. Choice B is incorrect and may result from dividing by 10, instead of by 100, and then neglecting to multiply by $20 when finding the sales tax. Choice D is incorrect and may result from interpreting the sales tax of 5% as $5.

Question Difficulty: Easy

Question ID 191d167b

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Percentages	■□□

ID: 191d167b

Last year, 200 students enrolled in an interior design program. This year, the number of students enrolled is 147% of last year's number. How many students are enrolled in the interior design program this year?

A. 247

B. 294

C. 347

D. 394

ID: 191d167b Answer

Correct Answer: B

Rationale

Choice B is correct. It's given that the number of students enrolled in an interior design program this year is 147% of last year's number, which is 200. 147% of 200 can be expressed as $\left(\frac{147}{100}\right)(200)$, or $(1.47)(200)$, which is equivalent to 294. Therefore, 294 students are enrolled in the interior design program this year.

Choice A 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 bb7c8186

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Percentages	■□□

ID: bb7c8186

What is 23% of 100?

A. 23

B. 46

C. 77

D. 123

ID: bb7c8186 Answer

Correct Answer: A

Rationale

Choice A is correct. 23% of 100 can be calculated by multiplying $\frac{23}{100}$ by 100, which yields $\left(\frac{23}{100}\right)100$, or 23.

Choice B is incorrect. This is 46%, not 23%, of 100.

Choice C is incorrect. This is 23% less than 100, not 23% of 100.

Choice D is incorrect. This is 23% greater than 100, not 23% of 100.

Question Difficulty: Easy

Question ID 949cd96b

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Percentages	■□□

ID: 949cd96b

The length of the base of a certain parallelogram is 89% of the height of the parallelogram. Which expression represents the length of the base of the parallelogram, where h is the height of the parallelogram?

A. $89h$

B. $0.089h$

C. $8.9h$

D. $0.89h$

ID: 949cd96b Answer

Correct Answer: D

Rationale

Choice D is correct. It's given that the length of the base of the parallelogram is 89% of the height of the parallelogram. Since h is the height of the parallelogram, it follows that the length of the base of the parallelogram can be represented by the expression $\frac{89}{100}h$, or $0.89h$.

Choice A is incorrect. This expression represents $8{,}900\%$, not 89%, of the height of the parallelogram.

Choice B is incorrect. This expression represents 8.9%, not 89%, of the height of the parallelogram.

Choice C is incorrect. This expression represents 890%, not 89%, of the height of the parallelogram.

Question Difficulty: Easy

Question ID 28c6bd8c

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Percentages	■□□

ID: 28c6bd8c

Where Do People Get Most of Their Medical Information?

Source	Percent of those surveyed
Doctor	63%
Internet	13%
Magazines/brochures	9%
Pharmacy	6%
Television	2%
Other/none of the above	7%

The table above shows a summary of 1,200 responses to a survey question. Based on the table, how many of those surveyed get most of their medical information from either a doctor or the Internet?

A. 865

B. 887

C. 912

D. 926

ID: 28c6bd8c Answer

Correct Answer: C

Rationale

Choice C is correct. According to the table, 63% of survey respondents get most of their medical information from a doctor and 13% get most of their medical information from the Internet. Therefore, 76% of the 1,200 survey respondents get their information from either a doctor or the Internet, and 76% of 1,200 is 912.

Choices A, B, and D are incorrect. According to the table, 76% of survey respondents get their information from either a doctor or the Internet. Choice A is incorrect because 865 is about 72% (the percent of survey respondents who get most of their medical information from a doctor or from magazines/brochures), not 76%, of 1,200. Choice B is incorrect because 887 is about 74%, not 76%, of 1,200. Choice D is incorrect because 926 is about 77%, not 76%, of 1,200.

Question Difficulty: Easy

Question ID 7ed0d098

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Percentages	■□□

ID: 7ed0d098

Lani spent 15% of her 8-hour workday in meetings. How many minutes of her workday did she spend in meetings?

A. 1.2

B. 15

C. 48

D. 72

ID: 7ed0d098 Answer

Correct Answer: D

Rationale

Choice D is correct. There are 60 minutes in one hour, so an 8-hour workday has $(60)(8) = 480$ minutes. To calculate 15% of 480, multiply 0.15 by 480: $(0.15)(480) = 72$. Therefore, Lani spent 72 minutes of her workday in meetings.

Choice A is incorrect because 1.2 is 15% of 8, which gives the time Lani spent of her workday in meetings in hours, not minutes. Choices B and C are incorrect and may be the result of computation errors.

Question Difficulty: Easy

Question ID 77cf4fa6

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Percentages	■□□

ID: 77cf4fa6

There are 170 blocks in a container. Of these blocks, 10% are green. How many blocks in the container are green?

ID: 77cf4fa6 Answer

Correct Answer: 17

Rationale

The correct answer is 17. It's given that there are 170 blocks in a container, and of these blocks, 10% are green. Since 10% can be rewritten as $\frac{10}{100}$, or 0.1, the number of green blocks in the container is $0.1(170)$, or 17.

Question Difficulty: Easy

Question ID 2d31caae

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Percentages	■□□

ID: 2d31caae

Call Ratings

	1 Star	2 Stars	3 Stars	4 Stars	Total
Employee A	16	49	72	8	145
Employee B	4	10	22	34	70
Employee C	8	56	45	16	125
Employee D	22	42	84	12	160
Total	50	157	223	70	500

A supervisor at a call center reviewed 500 calls taken by four employees and rated the employees' performance on each call on a scale from 1 star to 4 stars. The ratings for each employee are shown in the table above. According to the table, to the nearest whole percent, what percent of Employee A's calls received a rating of 1 star?

A. 3%

B. 11%

C. 16%

D. 32%

ID: 2d31caae Answer

Correct Answer: B

Rationale

Choice B is correct. The percent of Employee A's calls that received a rating of 1 star is the number of Employee A's 1-star calls divided by the total number of Employee A's calls. This quotient, $\frac{16}{145}$, is approximately equal to 0.1103, or 11.03%. To the nearest whole percent, this is 11%.

Choice A is incorrect. This is the percent of all calls taken by Employee A that received a rating of 1 star. Choice C is incorrect and may result from a conceptual error. For example, 16 is the number, not the percent, of calls taken by Employee A that received a rating of 1 star. Choice D is incorrect. This is the percent of all calls that received a rating of 1 star that were taken by Employee A.

Question Difficulty: Easy

Question ID 194ae3b1

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Percentages	■□□

ID: 194ae3b1

There were approximately 113,000 occupational therapy jobs in the United States in 2012. The Bureau of Labor Statistics has projected that this number will increase by 29% from 2012 to 2022. Of the following, which is closest to the number of occupational therapy jobs the bureau has projected for the United States in 2022?

A. 115,900

B. 116,300

C. 142,000

D. 145,800

ID: 194ae3b1 Answer

Correct Answer: D

Rationale

Choice D is correct. The decimal equivalent of 29% is 0.29. It's given that the 113,000 occupational therapy jobs in the United States in 2012 are projected to increase by 29% by 2022. Increasing 113,000 by 29% can be expressed as $(113{,}000)(1+0.29)$, or $(113{,}000)(1.29)$. Evaluating this expression yields 145,770. The closest number is 145,800 in choice D.

Choice A is incorrect and may result from increasing 113,000 by 2,900 instead of by 29%. Choice B is incorrect and may result from increasing 113,000 by 2.9% instead of by 29%. Choice C is incorrect and may result from increasing 113,000 by 29,000 instead of by 29%.

Question Difficulty: Easy

Question ID a8fabad0

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Percentages	■□□

ID: a8fabad0

A waiter receives tips from each customer. On average, the tip is 15% of the customer's bill. At this rate, which of the following is closest to the tip the waiter can expect when a customer has a bill that is $78.20?

A. $8.00

B. $10.00

C. $12.00

D. $14.00

ID: a8fabad0 Answer

Correct Answer: C

Rationale

Choice C is correct. If the bill is $78.20, 15% of the bill can be found by multiplying 78.20 by the decimal conversion of 15%, 78.20 × 0.15 = $11.73. The exact amount $11.73 is closest in value to $12.00.

Choices A, B, and D are incorrect and may be the result of errors when calculating 15% of the total $78.20.

Question Difficulty: Easy

Question ID 1c2f50a6

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Percentages	■□□

ID: 1c2f50a6

During a sale, the original prices of all the items in a clothing store have been reduced by 20%. What is the sale price of a jacket with an original price of $50 ?

A. $12

B. $30

C. $36

D. $40

ID: 1c2f50a6 Answer

Correct Answer: D

Rationale

Choice D is correct. It's given that the original price of the jacket has been reduced by 20%. Multiplying the original price, $50, by 20% gives the amount, in dollars, that the price of the jacket is reduced by: $50 \times .20 = 10$. Subtracting this value from the original price results in the sale price of the jacket: $\$50 - \$10$, or $40.

Choices A, B, and C are incorrect and may result from a conceptual or calculation error.

Question Difficulty: Easy

Question ID 048811bd

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Percentages	■□□

ID: 048811bd

What is 10% of 370?

A. 27

B. 37

C. 333

D. 360

ID: 048811bd Answer

Correct Answer: B

Rationale

Choice B is correct. 10% of a quantity means $\frac{10}{100}$ times the quantity. Therefore, 10% of 370 can be represented as $\frac{10}{100}(370)$, which is equivalent to $0.10(370)$, or 37. Therefore, 10% of 370 is 37.

Choice A is incorrect. This is 10% of 270, not 10% of 370.

Choice C is incorrect. This is 90% of 370, not 10% of 370.

Choice D is incorrect. This is $370 - 10$, not 10% of 370.

Question Difficulty: Easy

Question ID 6e4a60dd

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Percentages	■□□

ID: 6e4a60dd

Rita's total bill at a restaurant was $25.00, including tax. If she left a tip of 20% of the total bill, what was the amount of the tip?

A. $3.50

B. $4.00

C. $4.50

D. $5.00

ID: 6e4a60dd Answer

Correct Answer: D

Rationale

Choice D is correct. The total bill was $25.00. The percentage 20% is equivalent to the decimal 0.2. The tip is the product of the percentage and the total bill; therefore, $0.2 \times 25 = 5$, so the tip was $5.00.

Choices A, B, and C are incorrect and may be the result of incorrectly converting the given percentage or a calculation error.

Question Difficulty: Easy

Question ID 41b71b4e

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Percentages	■□□

ID: 41b71b4e

What number is 20% greater than 60 ?

A. 50

B. 72

C. 75

D. 132

ID: 41b71b4e Answer

Correct Answer: B

Rationale

Choice B is correct. The decimal equivalent of 20% is 0.2. The number that is 20% greater than 60 is also 120% of 60. The decimal equivalent of 120% is 1.2, and $1.2(60) = 72$.

Alternate approach: 10% of 60 is 6, and 20% of 60 is double that amount, or 12. It follows that the number that is 20% greater than 60 is 12 more than 60, or $60 + 12 = 72$.

Choice A is incorrect and may result from dividing, instead of multiplying, 60 by 1.2. Choice C is incorrect because it's 25% greater than 60, rather than 20% greater than 60. Choice D is incorrect and may result from multiplying 60 by 2.2 instead of 1.2.

Question Difficulty: Easy

Question ID 707db2d3

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Percentages	■■□

ID: 707db2d3

For the finale of a TV show, viewers could use either social media or a text message to vote for their favorite of two contestants. The contestant receiving more than 50% of the vote won. An estimated 10% of the viewers voted, and 30% of the votes were cast on social media. Contestant 2 earned 70% of the votes cast using social media and 40% of the votes cast using a text message. Based on this information, which of the following is an accurate conclusion?

A. If all viewers had voted, Contestant 2 would have won.

B. Viewers voting by social media were likely to be younger than viewers voting by text message.

C. If all viewers who voted had voted by social media instead of by text message, Contestant 2 would have won.

D. Viewers voting by social media were more likely to prefer Contestant 2 than were viewers voting by text message.

ID: 707db2d3 Answer

Correct Answer: D

Rationale

Choice D is correct. It is given that Contestant 2 earned 70% of the votes cast using social media and 40% of the votes cast using a text message. Based on this information, viewers voting by social media were more likely to prefer Contestant 2 than were viewers voting by text message.

Choices A, B, and C are incorrect. There is not enough information about the viewers to reach these conclusions.

Question Difficulty: Medium

Question ID 63573fea

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Percentages	■■□

ID: 63573fea

During the first month of sales, a company sold 1,300,000 units of a certain type of smartphone. During the same month, 15% of the units sold were returned. If sales and the return rate remain the same for each of the next 5 months, about how many units of this smartphone will be returned to the company during this 6-month period?

A. 195,000

B. 975,000

C. 1,170,000

D. 6,630,000

ID: 63573fea Answer

Correct Answer: C

Rationale

Choice C is correct. Of the 1,300,000 units sold during the first month, 15% were returned, so $(1{,}300{,}000)(0.15) = 195{,}000$ units were returned during the first month. If the units were sold and returned at the same rate for the next 5 months, then a total of $(195{,}000)(6) = 1{,}170{,}000$ smartphone units were returned during the 6-month period.

Choice A is incorrect. This is the number of units that were returned in 1 month. Choice B is incorrect. This is the number of units that were returned in 5 months. Choice D is incorrect. This is the number of units sold and not returned during the first 6 months.

Question Difficulty: Medium

Question ID 8a714fa1

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Percentages	■■□

ID: 8a714fa1

Which of the following represents the result of increasing the quantity *x* by 9%, where $x > 0$?

A. $1.09x$

B. $0.09x$

C. $x + 9$

D. $x + 0.09$

ID: 8a714fa1 Answer

Correct Answer: A

Rationale

Choice A is correct. Increasing the positive quantity x by 9% is the result of adding 9% of x to x. 9% of x can be represented algebraically as $\frac{9}{100}x$, or $0.09x$. Adding this expression to x yields $x + 0.09x$, or $1.09x$.

Choice B is incorrect. This represents 9% of x. Choice C is incorrect. This represents increasing x by 9, not by 9%. Choice D is incorrect. This represents increasing x by 0.09, not by 9%.

Question Difficulty: Medium

Question ID 8e2e424e

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Percentages	■■□

ID: 8e2e424e

The number k is 36% greater than 50. If k is the product of 50 and r, what is the value of r ?

A. 36

B. 3.6

C. 1.36

D. 0.36

ID: 8e2e424e Answer

Correct Answer: C

Rationale

Choice C is correct. It's given that the number k is 36% greater than 50. Therefore, the value of k is the number 50 plus 36% of 50. This can be rewritten as $k = 50 + \left(\frac{36}{100}\right)(50)$. Multiplying the terms $\left(\frac{36}{100}\right)(50)$ yields 18, so $k = 50 + 18$, or $k = 68$. It's also given that k is the product of 50 and r, which can be rewritten as $k = 50r$. Substituting 68 for k yields $68 = 50r$. Dividing both sides of this equation by 50 yields $r = 1.36$.

Choice A is incorrect. This is the percentage that k is greater than 50. Choice B is incorrect and may result from a calculation error. Choice D is incorrect. This would be the value of r if k were 36% of 50, instead of 36% greater than 50.

Question Difficulty: Medium

Question ID 709e04de

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Percentages	■■□

ID: 709e04de

The value of z is 1.13 times 100. The value of z is what percent greater than 100?

A. 11.3

B. 13

C. 130

D. 213

ID: 709e04de Answer

Correct Answer: B

Rationale

Choice B is correct. It's given that the value of z is 1.13 times 100. This can be written as $z = (1.13)(100)$, which is equivalent to $z = (1 + 0.13)(100)$, or $z = \left(1 + \frac{13}{100}\right)(100)$. It follows that the value of z is 100% of 100 plus 13% of 100. Therefore, the value of z is 13% greater than 100.

Choice A is incorrect. This gives a value of z that is 1.113, not 1.13, times 100.

Choice C is incorrect. This gives a value of z that is 2.30, not 1.13, times 100.

Choice D is incorrect. This gives a value of z that is 3.13, not 1.13, times 100.

Question Difficulty: Medium

Question ID 8cbf1415

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Percentages	■■□

ID: 8cbf1415

In a group, 40% of the items are red. Of all the red items in the group, 30% also have stripes. What percentage of the items in the group are red with stripes?

A. 10%

B. 12%

C. 70%

D. 75%

ID: 8cbf1415 Answer

Correct Answer: B

Rationale

Choice B is correct. It's given that in a group, 40% of the items are red. It follows that the number of red items in the group can be represented by $0.4x$, where x represents the total number of items in the group. It's also given that of all the red items in the group, 30% also have stripes. It follows that the number of items in the group that are red and have stripes can be represented by $0.3(0.4x)$, or $0.12x$. The expression $0.12x$ represents 12% of x. Since x represents the total number of items in the group, it follows that 12% of the items in the group are red and have stripes.

Choice A is incorrect and may result from subtracting 30% from 40% rather than calculating 30% of 40%.

Choice C is incorrect and may result from adding 30% and 40% rather than calculating 30% of 40%.

Choice D is incorrect and may result from calculating the percentage that 30% is of 40% rather than calculating 30% of 40%.

Question Difficulty: Medium

Question ID 96a45430

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Percentages	■■□

ID: 96a45430

A number n is increased 6%. If the result is 318, what is the value of n ?

A. 199

B. 299

C. 300

D. 337

ID: 96a45430 Answer

Correct Answer: C

Rationale

Choice C is correct. The decimal equivalent of 6% is 0.06. Since increasing the number n by 6% yields the number 318, this situation can be represented by the equation $n(1+0.06)=318$, or $n(1.06)=318$. Dividing both sides of this equation by 1.06 yields $n=300$.

Choice A is incorrect. This is the result when n is increased by 60%, not by 6%. Choice B is incorrect. This is the approximate result of decreasing 318 by 6%. Choice D is incorrect. This is the approximate result of increasing 318 by 6%.

Question Difficulty: Medium

Question ID b2f6f17d

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Percentages	■■□

ID: b2f6f17d

A customer's monthly water bill was $75.74. Due to a rate increase, her monthly bill is now $79.86. To the nearest tenth of a percent, by what percent did the amount of the customer's water bill increase?

A. 4.1%

B. 5.1%

C. 5.2%

D. 5.4%

ID: b2f6f17d Answer

Correct Answer: D

Rationale

Choice D is correct. To find the percent increase of the customer's water bill, the absolute increase of the bill, in dollars, is divided by the original amount of the bill, and the result is multiplied by 100%, as follows: $\frac{79.86-75.74}{75.74}\approx 0.054$; $0.054\times 100\% = 5.4\%$.

Choice A is incorrect. This choice is the difference $79.86-75.74$ rounded to the nearest tenth, which is the (absolute) increase of the bill's amount, not its percent increase. Choice B is incorrect and may be the result of some calculation errors. Choice C is incorrect and is the result of dividing the difference between the two bill amounts by the new bill amount instead of the original bill amount.

Question Difficulty: Medium

Question ID 94c65646

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Percentages	■■□

ID: 94c65646

432 is 96% of what number?

ID: 94c65646 Answer

Correct Answer: 450

Rationale

The correct answer is 450. Let x represent the number that 432 is 96% of. This can be written as $\left(\frac{96}{100}\right)x = 432$, or $0.96x = 432$. Dividing both sides of this equation by 0.96 yields $x = 450$. Therefore, 432 is 96% of 450.

Question Difficulty: Medium

Question ID 7b731fc3

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Percentages	■■□

ID: 7b731fc3

What number is 40% greater than 115?

ID: 7b731fc3 Answer

Correct Answer: 161

Rationale

The correct answer is 161. For a number to be 40% greater than 115, it follows that the number is $(100\% \text{ of } 115) + (40\% \text{ of } 115)$, which can be written as $\frac{100}{100}(115) + \frac{40}{100}(115)$. This expression is equivalent to $1(115) + 0.4(115)$, or $1.4(115)$, which is equal to 161. Therefore, 161 is 40% greater than 115.

Question Difficulty: Medium

Question ID 566759ef

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Percentages	■■□

ID: 566759ef

Thomas installed a new stove in his restaurant. At the time of installation, the stove had a value of $800. Thomas estimates that each year the value of the stove will depreciate by 20% of the previous year's estimated value. What is the estimated value of the stove exactly 2 years after Thomas installed it?

A. $480

B. $512

C. $556

D. $640

ID: 566759ef Answer

Rationale

Choice B is correct. If the stove's value depreciates by 20% of the previous year's estimated value, then each year it retains 100% – 20% = 80%, or 0.80, of the previous year's estimated value. Since the stove's value was $800 when Thomas installed it, the estimated value after two years would be (0.80)(0.80)($800) = $512.

Choice A is incorrect. This is the value of the stove if each year it had depreciated by 20% of the original value rather than by 20% of the previous year's estimated value. Choice C is incorrect and may be the result of a computational error. Choice D is incorrect. This is the estimated value of the stove 1 year after Thomas installed it, not 2 years.

Question Difficulty: Medium

Question ID 954943a4

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Percentages	■■■

ID: 954943a4

Jennifer bought a box of Crunchy Grain cereal. The nutrition facts on the box state that a serving size of the cereal is $\frac{3}{4}$ cup and provides 210 calories, 50 of which are calories from fat. In addition, each serving of the cereal provides 180 milligrams of potassium, which is 5% of the daily allowance for adults. If p percent of an adult's daily allowance of potassium is provided by x servings of Crunchy Grain cereal per day, which of the following expresses p in terms of x ?

A. $p = 0.5x$

B. $p = 5x$

C. $p = (0.05)^x$

D. $p = (1.05)^x$

ID: 954943a4 Answer

Correct Answer: B

Rationale

Choice B is correct. It's given that each serving of Crunchy Grain cereal provides 5% of an adult's daily allowance of potassium, so x servings would provide x times 5%. The percentage of an adult's daily allowance of potassium, p, is 5 times the number of servings, x. Therefore, the percentage of an adult's daily allowance of potassium can be expressed as $p = 5x$.

Choices A, C, and D are incorrect and may result from incorrectly converting 5% to its decimal equivalent, which isn't necessary since p is expressed as a percentage. Additionally, choices C and D are incorrect because the context should be represented by a linear relationship, not by an exponential relationship.

Question Difficulty: Hard

Question ID 65c49824

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Percentages	■■■

ID: 65c49824

A school district is forming a committee to discuss plans for the construction of a new high school. Of those invited to join the committee, 15% are parents of students, 45% are teachers from the current high school, 25% are school and district administrators, and the remaining 6 individuals are students. How many more teachers were invited to join the committee than school and district administrators?

ID: 65c49824 Answer

Rationale

The correct answer is 8. The 6 students represent $(100-15-45-25)\% = 15\%$ of those invited to join the committee. If x people were invited to join the committee, then $0.15x = 6$. Thus, there were $\frac{6}{0.15} = 40$ people invited to join the committee. It follows that there were $0.45(40) = 18$ teachers and $0.25(40) = 10$ school and district administrators invited to join the committee. Therefore, there were 8 more teachers than school and district administrators invited to join the committee.

Question Difficulty: Hard

Question ID 0ea56bb2

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Percentages	■■■

ID: 0ea56bb2

Year	Subscriptions sold
2012	5,600
2013	5,880

The manager of an online news service received the report above on the number of subscriptions sold by the service. The manager estimated that the percent increase from 2012 to 2013 would be double the percent increase from 2013 to 2014. How many subscriptions did the manager expect would be sold in 2014?

A. 6,020

B. 6,027

C. 6,440

D. 6,468

ID: 0ea56bb2 Answer

Correct Answer: B

Rationale

Choice B is correct. The percent increase from 2012 to 2013 was $\frac{5,880-5,600}{5,600}=0.05$, or 5%. Since the percent increase from 2012 to 2013 was estimated to be double the percent increase from 2013 to 2014, the percent increase from 2013 to 2014 was expected to be 2.5%.
Therefore, the number of subscriptions sold in 2014 is expected to be the number of subscriptions sold in 2013 multiplied by $(1+0.025)$, or $5,880(1.025)=6,027$.

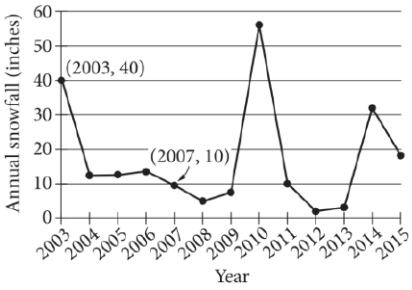
Choice A is incorrect and is the result of adding half of the value of the increase from 2012 to 2013 to the 2013 result. Choice C is incorrect and is the result adding twice the value of the increase from 2012 to 2013 to the 2013 result. Choice D is incorrect and is the result of interpreting the percent increase from 2013 to 2014 as double the percent increase from 2012 to 2013.

Question Difficulty: Hard

Question ID 0231050d

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Percentages	■■■

ID: 0231050d



The line graph shows the total amount of snow, in inches, recorded each year in Washington, DC, from 2003 to 2015. If $p\%$ is the percent decrease in the annual snowfall from 2003 to 2007, what is the value of p ?

ID: 0231050d Answer

Rationale

The correct answer is 75. The percent decrease between two values is found by dividing the difference between the two values by the original value and multiplying by 100. The line graph shows that the annual snowfall in 2003 was 40 inches, and the annual snowfall in 2007 was 10 inches. Therefore, the percent decrease in the annual snowfall from 2003 to 2007 is $\left(\frac{40-10}{40}\right)(100)$, or 75. It's given that this is equivalent to $p\%$, so the value of p is 75.

Question Difficulty: Hard

Question ID 67c0200a

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Percentages	■■■

ID: 67c0200a

The number a is 70% less than the positive number b. The number c is 80% greater than a. The number c is how many times b?

ID: 67c0200a Answer

Correct Answer: .54, 27/50

Rationale

The correct answer is $.54$. It's given that the number a is 70% less than the positive number b. Therefore, $a = \left(1 - \frac{70}{100}\right)b$, which is equivalent to $a = (1 - 0.70)b$, or $a = 0.30b$. It's also given that the number c is 80% greater than a. Therefore, $c = \left(1 + \frac{80}{100}\right)a$, which is equivalent to $c = (1 + 0.80)a$, or $c = 1.80a$. Since $a = 0.30b$, substituting $0.30b$ for a in the equation $c = 1.80a$ yields $c = 1.80(0.30b)$, or $c = 0.54b$. Thus, c is 0.54 times b. Note that .54 and 27/50 are examples of ways to enter a correct answer.

Question Difficulty: Hard

Question ID 55818046

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Percentages	■■■

ID: 55818046

According to the 2010 Census, the adult population aged 18 years or greater of the United States in 2010 was 234,564,071. In 2010, a survey was conducted among a randomly chosen sample of adults aged 18 years or greater in the United States about their preference to live in a warm climate or a cool climate. The table below displays a summary of the survey results.

Climate Preferences

	Warm	Cool	No preference	Total
18–35 years old	295	168	45	508
36–50 years old	246	123	41	410
51–65 years old	238	117	48	403
Greater than 65 years old	137	78	64	279
Total	916	486	198	1,600

Which of the following is closest to the difference between the percentage of adults aged 18–50 years who responded “warm” and the percentage of adults aged 51 years or greater who responded “warm”?

A. 4%

B. 5%

C. 10%

D. 18%

ID: 55818046 Answer

Correct Answer: A

Rationale

Choice A is correct. The percentage of adults aged 18–50 who responded “warm” is $\frac{295+246}{508+410}=\frac{541}{918}$, or about 58.9%. The percentage of adults aged 51 years or greater who responded “warm” is $\frac{238+137}{403+279}=\frac{375}{682}$, or about 55.0%. The difference between 58.9% and 55.0% is 3.9%. Of the answer choices, 4% is closest to this number.

Choices B, C, and D are incorrect and may result from calculation errors.

Question Difficulty: Hard

Question ID 20845d36

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Percentages	■■■

ID: 20845d36

The number a is 70% less than the positive number b. The number c is 60% greater than a. The number c is how many times b?

ID: 20845d36 Answer

Correct Answer: .48, 12/25

Rationale

The correct answer is $.48$. It's given that the number a is 70% less than the positive number b. Therefore, $a = \left(1 - \frac{70}{100}\right)b$, which is equivalent to $a = (1 - 0.70)b$, or $a = 0.30b$. It's also given that the number c is 60% greater than a. Therefore, $c = \left(1 + \frac{60}{100}\right)a$, which is equivalent to $c = (1 + 0.60)a$, or $c = 1.60a$. Since $a = 0.30b$, substituting $0.30b$ for a in the equation $c = 1.60a$ yields $c = 1.60(0.30b)$, or $c = 0.48b$. Thus, c is 0.48 times b. Note that .48 and 12/25 are examples of ways to enter a correct answer.

Question Difficulty: Hard

Question ID 8c5dbd3e

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Percentages	■■■

ID: 8c5dbd3e

The number w is 110% greater than the number z. The number z is 55% less than 50. What is the value of w?

ID: 8c5dbd3e Answer

Correct Answer: 189/4, 47.25

Rationale

The correct answer is 47.25. It's given that the number w is 110% greater than the number z. It follows that $w = \left(1 + \frac{110}{100}\right)z$, or $w = 2.1z$. It's also given that the number z is 55% less than 50. It follows that $z = \left(1 - \frac{55}{100}\right)(50)$, or $z = 0.45(50)$, which yields $z = 22.5$. Substituting 22.5 for z in the equation $w = 2.1z$ yields $w = 2.1(22.5)$, which is equivalent to $w = 47.25$. Therefore, the value of w is 47.25. Note that 47.25 and 189/4 are examples of ways to enter a correct answer.

Question Difficulty: Hard

Question ID 8213b1b3

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Percentages	■■■

ID: 8213b1b3

According to a set of standards, a certain type of substance can contain a maximum of 0.001% phosphorus by mass. If a sample of this substance has a mass of 140 grams, what is the maximum mass, in grams, of phosphorus the sample can contain to meet these standards?

ID: 8213b1b3 Answer

Correct Answer: .0014

Rationale

The correct answer is $.0014$. It's given that a certain type of substance can contain a maximum of 0.001% phosphorus by mass to meet a set of standards. If a sample of the substance has a mass of 140 grams, it follows that the maximum mass, in grams, of phosphorus the sample can contain to meet the standards is 0.001% of 140, or $\frac{0.001}{100}(140)$, which is equivalent to $(0.00001)(140)$, or 0.0014. Note that .0014 and 0.001 are examples of ways to enter a correct answer.

Question Difficulty: Hard

Question ID 34f8cd89

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Percentages	■■■

ID: 34f8cd89

37% of the items in a box are green. Of those, 37% are also rectangular. Of the green rectangular items, 42% are also metal. Which of the following is closest to the percentage of the items in the box that are not rectangular green metal items?

A. 1.16%

B. 57.50%

C. 94.25%

D. 98.84%

ID: 34f8cd89 Answer

Correct Answer: C

Rationale

Choice C is correct. It's given that 37% of the items in a box are green. Let x represent the total number of items in the box. It follows that $\frac{37}{100}x$, or $0.37x$, items in the box are green. It's also given that of those, 37% are also rectangular. Therefore, $\frac{37}{100}(0.37x)$, or $0.1369x$, items in the box are green rectangular items. It's also given that of the green rectangular items, 42% are also metal. Therefore, $\frac{42}{100}(0.1369x)$, or $0.057498x$, items in the box are rectangular green metal items. The number of the items in the box that are not rectangular green metal items is the total number of items in the box minus the number of rectangular green metal items in the box. Therefore, the number of items in the box that are not rectangular green metal items is $x - 0.057498x$, or $0.942502x$. The percentage of items in the box that are not rectangular green metal items is the percentage that $0.942502x$ is of x. If $p\%$ represents this percentage, the value of p is $100\left(\frac{0.942502x}{x}\right)$, or 94.2502. Of the given choices, 94.25% is closest to the percentage of items in the box that are not rectangular green metal items.

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 25faa756

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Percentages	■■■

ID: 25faa756

The number a is 60% greater than the positive number b. The number c is 45% less than a. The number c is how many times b?

ID: 25faa756 Answer

Correct Answer: .88, 22/25

Rationale

The correct answer is $.88$. It's given that the number a is 60% greater than the positive number b. Therefore, $a = \left(1 + \frac{60}{100}\right)b$, which is equivalent to $a = (1 + 0.60)b$, or $a = 1.60b$. It's also given that the number c is 45% less than a. Therefore, $c = \left(1 - \frac{45}{100}\right)a$, which is equivalent to $c = (1 - 0.45)a$, or $c = 0.55a$. Since $a = 1.60b$, substituting $1.60b$ for a in the equation $c = 0.55a$ yields $c = 0.55(1.60b)$, or $c = 0.88b$. Thus, the number c is 0.88 times the number b. Note that .88 and 22/25 are examples of ways to enter a correct answer.

Question Difficulty: Hard

Question ID ad911622

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Percentages	■■■

ID: ad911622

The value of a collectible comic book increased by 167% from the end of 2011 to the end of 2012 and then decreased by 16% from the end of 2012 to the end of 2013. What was the net percentage increase in the value of the collectible comic book from the end of 2011 to the end of 2013?

A. 124.28%

B. 140.28%

C. 151.00%

D. 209.72%

ID: ad911622 Answer

Correct Answer: A

Rationale

Choice A is correct. It's given that the value of the comic book increased by 167% from the end of 2011 to the end of 2012. Therefore, if the value of the comic book at the end of 2011 was x dollars, then the value, in dollars, of the comic book at the end of 2012 was $x + \left(\frac{167}{100}\right)x$, which can be rewritten as $1x + 1.67x$, or $2.67x$. It's also given that the value of the comic book decreased by 16% from the end of 2012 to the end of 2013. Therefore, the value, in dollars, of the comic book at the end of 2013 was $2.67x - 2.67x\left(\frac{16}{100}\right)$, which can be rewritten as $2.67x - (2.67x)(0.16)$, or $2.2428x$. Thus, if the value of the comic book at the end of 2011 was x dollars, and the value of the comic book at the end of 2013 was $2.2428x$ dollars, then from the end of 2011 to the end of 2013, the value of the comic book increased by $2.2428x - 1x$, or $1.2428x$, dollars. Therefore, the increase in the value of the comic book from the end of 2011 to the end of 2013 is equal to 1.2428 times the value of the comic book at the end of 2011. It follows that from the end of 2011 to the end of 2013, the net percentage increase in the value of the comic book was $(1.2428)(100)\%$, or 124.28%.

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

Choice C is incorrect. This is the difference between the net percentage increase in the value of the comic book from the end of 2011 to the end of 2012 and the net percentage decrease in the value of the comic book from the end of 2012 to the end of 2013, not the net percentage increase in the value of the comic book from the end of 2011 to the end of 2013.

Choice D is incorrect. This is the net percentage increase in the value of the comic book from the end of 2011 to the end of 2013, if the value of the comic book increased by 167% from the end of 2011 to the end of 2012 and then increased, not decreased, by 16% from the end of 2012 to the end of 2013.

Question Difficulty: Hard