

# Question ID c9fad009

| Assessment | Test | Domain                            | Skill       | Difficulty                                   |
|------------|------|-----------------------------------|-------------|----------------------------------------------|
| PSAT 8/9   | Math | Problem-Solving and Data Analysis | Percentages | <div><div></div><div></div><div></div></div> |

ID: c9fad009

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: c9fad009 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,  $a = 1 - \frac{70}{100}b$ , which is equivalent to  $a = 1 - 0.70b$ , or  $a = 0.30b$ . It's also given that the number  $c$  is 60% greater than  $a$ . Therefore,  $c = 1 + \frac{60}{100}a$ , which is equivalent to  $c = 1 + 0.60a$ , 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 4e5308ae

| Assessment | Test | Domain                            | Skill       | Difficulty                                   |
|------------|------|-----------------------------------|-------------|----------------------------------------------|
| PSAT 8/9   | Math | Problem-Solving and Data Analysis | Percentages | <div><div></div><div></div><div></div></div> |

ID: 4e5308ae

What number is 40% greater than 115?

ID: 4e5308ae 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 % of 115 + 40 % of 115, which can be written as  $\frac{100}{100}115 + \frac{40}{100}115$ . This expression is equivalent to  $115 + 0.4115$ , or  $1.4115$ , which is equal to 161. Therefore, 161 is 40% greater than 115.

Question Difficulty: Hard

# Question ID 2894ecee

| Assessment | Test | Domain                            | Skill       | Difficulty                                   |
|------------|------|-----------------------------------|-------------|----------------------------------------------|
| PSAT 8/9   | Math | Problem-Solving and Data Analysis | Percentages | <div><div></div><div></div><div></div></div> |

ID: 2894ecee

13 is  $p\%$  of 25. What is the value of  $p$ ?

ID: 2894ecee Answer

Correct Answer: 52

Rationale

The correct answer is 52. It's given that 13 is  $p\%$  of 25. It follows that  $\frac{13}{25} = \frac{p}{100}$ . Multiplying both sides of this equation by 100 gives  $52 = p$ . Therefore, the value of  $p$  is 52.

Question Difficulty: Hard

# Question ID 9ac5d061

| Assessment | Test | Domain                            | Skill       | Difficulty                                   |
|------------|------|-----------------------------------|-------------|----------------------------------------------|
| PSAT 8/9   | Math | Problem-Solving and Data Analysis | Percentages | <div><div></div><div></div><div></div></div> |

ID: 9ac5d061

The population of Greenville increased by **7%** from **2015** to **2016**. If the **2016** population is ***k*** times the **2015** population, what is the value of ***k***?

- A. **0.07**
- B. **0.7**
- C. **1.07**
- D. **1.7**

ID: 9ac5d061 Answer

Correct Answer: C

Rationale

Choice C is correct. Let  $x$  be the 2015 population of Greenville. It's given that the population increased by 7% from 2015 to 2016. The increase in population can be written as  $0.07x$ . The 2016 population of Greenville is given as the sum of the 2015 population of Greenville and the increase in population from 2015 to 2016. This can be rewritten as  $x + 0.07x$ , or  $1.07x$ . Therefore, the value of  $k$  is 1.07.

Choice A is incorrect. This is the percent, represented as a decimal, that the population increased from 2015 to 2016, not the value of  $k$ .

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

Choice D is incorrect. This is the value of  $k$  if the population increased by 70%, not 7%, from 2015 to 2016.

Question Difficulty: Hard

Question ID a963160e

| Assessment | Test | Domain                            | Skill       | Difficulty                                   |
|------------|------|-----------------------------------|-------------|----------------------------------------------|
| PSAT 8/9   | Math | Problem-Solving and Data Analysis | Percentages | <div><div></div><div></div><div></div></div> |

ID: a963160e

The positive number  $a$  is **230%** of the number  $b$ , and  $a$  is **60%** of the number  $c$ . If  $c$  is  $p\%$  of  $b$ , which of the following is closest to the value of  $p$ ?

- A. 138
- B. 217
- C. 283
- D. 383

ID: a963160e Answer

Correct Answer: D

Rationale

Choice D is correct. It's given that  $a$  is 230% of  $b$ . It follows that  $a = \frac{230}{100}b$ . It's also given that  $a$  is 60% of  $c$ . It follows that  $a = \frac{60}{100}c$ . Since  $a = \frac{230}{100}b$  and  $a = \frac{60}{100}c$ , it follows that  $\frac{230}{100}b = \frac{60}{100}c$ . Multiplying each side of this equation by  $\frac{100}{60}$  yields  $\frac{23}{6}b = c$ . If  $c$  is  $p\%$  of  $b$ , then  $c = \frac{p}{100}b$ . It follows that  $\frac{23}{6} = \frac{p}{100}$ . Multiplying each side of this equation by 100 yields  $\frac{2,300}{6} = p$ . It follows that the value of  $p$  is approximately 383.33. Therefore, of the given choices, 383 is closest to the value of  $p$ .

Choice A is incorrect. This is closest to the value of  $p$  if  $b$  is 230% of  $a$ , rather than if  $a$  is 230% of  $b$ , and if  $b$  is  $p\%$  of  $c$ , rather than if  $c$  is  $p\%$  of  $b$ .

Choice B is incorrect. This is closest to the value of  $p$  if  $a$  is 230% greater than  $b$ , rather than 230% of  $b$ .

Choice C is incorrect. This is closest to the value of  $p$  if  $c$  is  $p\%$  greater than  $b$ , rather than  $p\%$  of  $b$ .

Question Difficulty: Hard

# Question ID cba3004b

| Assessment | Test | Domain                            | Skill       | Difficulty                                   |
|------------|------|-----------------------------------|-------------|----------------------------------------------|
| PSAT 8/9   | Math | Problem-Solving and Data Analysis | Percentages | <div><div></div><div></div><div></div></div> |

ID: cba3004b

The number of coins in a collection increased from **9** to **90**. What was the percent increase in the number of coins in this collection?

- A. 10%

B. 81%

C. 90%

D. 900%

ID: cba3004b Answer

Correct Answer: D

Rationale

Choice D is correct. It's given that the number of coins in the collection increased from 9 to 90. It follows that the number of coins in the collection increased by  $90 - 9$ , or 81. Let  $x\%$  represent the percentage that 81 is of 9. The value of  $x$  can be found using the proportion  $\frac{81}{9} = \frac{x}{100}$ , or  $9 = \frac{x}{100}$ . Multiplying both sides of this equation by 100 yields  $900 = x$ . Thus, when the number of coins in the collection increased from 9 to 90, the percent increase was 900%.

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

Question Difficulty: Hard

# Question ID 2cc8781a

| Assessment | Test | Domain                            | Skill       | Difficulty                                   |
|------------|------|-----------------------------------|-------------|----------------------------------------------|
| PSAT 8/9   | Math | Problem-Solving and Data Analysis | Percentages | <div><div></div><div></div><div></div></div> |

ID: 2cc8781a

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: 2cc8781a 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  $x + \frac{167}{100}x$ , 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  $2.67x - 2.67x\frac{16}{100}$ , which can be rewritten as  $2.67x - 2.67x0.16$ , 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 1.2428100%, 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

# Question ID b7a6f094

| Assessment | Test | Domain                            | Skill       | Difficulty                                   |
|------------|------|-----------------------------------|-------------|----------------------------------------------|
| PSAT 8/9   | Math | Problem-Solving and Data Analysis | Percentages | <div><div></div><div></div><div></div></div> |

ID: b7a6f094

A scientist studying the life cycle of dragonflies counted the number of dragonflies in a certain habitat each day for **46** days. On February **15**, there were **99** dragonflies in the habitat. The percent increase in the number of dragonflies in the habitat from January **1** to February **15** was **12.50%**. How many dragonflies were in the habitat on January **1**?

- A. 88
- B. 87
- C. 12
- D. 8

ID: b7a6f094 Answer

Correct Answer: A

Rationale

Choice A is correct. It’s given that a scientist studying the life cycle of dragonflies counted the number of dragonflies in a certain habitat each day for 46 days. It’s also given that on February 15, there were 99 dragonflies in the habitat and that the percent increase in the number of dragonflies in the habitat from January 1 to February 15 was 12.50%. This can be represented by the equation  $99 = 1 + \frac{12.50}{100}x$ , where  $x$  represents the number of dragonflies in the habitat on January 1. This equation can be rewritten as  $99 = 1.125x$ . Dividing both sides of this equation by 1.125 yields  $88 = x$ . Therefore, there were 88 dragonflies in the habitat on January 1.

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: Hard

# Question ID f956e2a2

| Assessment | Test | Domain                            | Skill       | Difficulty                                   |
|------------|------|-----------------------------------|-------------|----------------------------------------------|
| PSAT 8/9   | Math | Problem-Solving and Data Analysis | Percentages | <div><div></div><div></div><div></div></div> |

ID: f956e2a2

A gift shop buys souvenirs at a wholesale price of **7.00** dollars each and resells them each at a retail price that is **290%** of the wholesale price. At the end of the season, any remaining souvenirs are marked at a discounted price that is **80%** off the retail price. What is the discounted price of each remaining souvenir, in dollars?

ID: f956e2a2 Answer

Correct Answer: 203/50, 4.06

Rationale

The correct answer is 4.06. It's given that the retail price is 290% of the wholesale price of \$ 7.00. Thus, the retail price is  $\$ 7.00 \frac{290}{100}$ , which is equivalent to \$ 7.002.9, or \$ 20.30. It's also given that the discounted price is 80% off the retail price. Thus, the discounted price is  $\$ 20.301 - \frac{80}{100}$ , which is equivalent to \$ 20.300.20, or \$ 4.06.

Question Difficulty: Hard

# Question ID 90c6099e

| Assessment | Test | Domain                            | Skill       | Difficulty                                   |
|------------|------|-----------------------------------|-------------|----------------------------------------------|
| PSAT 8/9   | Math | Problem-Solving and Data Analysis | Percentages | <div><div></div><div></div><div></div></div> |

ID: 90c6099e

An insurance company offers a series of three information sessions. **1,250** people attended the first information session. **72%** of the people who attended the first information session attended the second information session, and **36%** of the people who attended the first and second information sessions attended the third information session. How many people attended all three information sessions?

ID: 90c6099e Answer

Correct Answer: 324

Rationale

The correct answer is 324. It's given that 1,250 people attended the first information session, and that 72% of the people who attended the first information session attended the second information session. Therefore, the number of people who attended the first and second information sessions can be found by calculating 72% of 1,250, which is equal to  $1,250 \times \frac{72}{100}$ , or 900. It's also given that 36% of the people who attended the first and second information sessions attended the third information session. Since 900 people attended the first and second information sessions, the number of people who attended the first, second, and third information sessions can be found by calculating 36% of 900, which is equal to  $900 \times \frac{36}{100}$ , or 324. Therefore, 324 people attended all three information sessions.

Question Difficulty: Hard

# Question ID 452a80e3

| Assessment | Test | Domain                            | Skill       | Difficulty                                   |
|------------|------|-----------------------------------|-------------|----------------------------------------------|
| PSAT 8/9   | Math | Problem-Solving and Data Analysis | Percentages | <div><div></div><div></div><div></div></div> |

ID: 452a80e3

The result of increasing the quantity  $x$  by 1,800% is 684. What is the value of  $x$ ?

- A. 12,996
- B. 12,312
- C. 38
- D. 36

ID: 452a80e3 Answer

Correct Answer: D

Rationale

Choice D is correct. It's given that the result of increasing the quantity  $x$  by 1,800% is 684. It follows that  $x + \frac{1,800}{100}x = 684$ , which is equivalent to  $x + 18x = 684$ , or  $19x = 684$ . Dividing each side of this equation by 19 yields  $x = 36$ . Therefore, the value of  $x$  is 36.

Choice A is incorrect. The result of increasing the quantity 12,996 by 1,800% is 246,924, not 684.

Choice B is incorrect. The result of increasing the quantity 12,312 by 1,800% is 233,928, not 684.

Choice C is incorrect. The result of increasing the quantity 38 by 1,800% is 722, not 684.

Question Difficulty: Hard

# Question ID a0707653

| Assessment | Test | Domain                            | Skill       | Difficulty                                   |
|------------|------|-----------------------------------|-------------|----------------------------------------------|
| PSAT 8/9   | Math | Problem-Solving and Data Analysis | Percentages | <div><div></div><div></div><div></div></div> |

ID: a0707653

The result of increasing the quantity  $x$  by 400% is 60. What is the value of  $x$ ?

- A. 12
- B. 15
- C. 240
- D. 340

ID: a0707653 Answer

Correct Answer: A

Rationale

Choice A is correct. It's given that the result of increasing the quantity  $x$  by 400% is 60. This can be written as  $x + \frac{400}{100}x = 60$ , which is equivalent to  $x + 4x = 60$ , or  $5x = 60$ . Dividing each side of this equation by 5 yields  $x = 12$ . Therefore, the value of  $x$  is 12.

Choice B is incorrect. The result of increasing the quantity 15 by 400% is 75, not 60.

Choice C is incorrect. The result of increasing the quantity 240 by 400% is 1,200, not 60.

Choice D is incorrect. The result of increasing the quantity 340 by 400% is 1,700, not 60.

Question Difficulty: Hard

# Question ID 86174ce1

| Assessment | Test | Domain                            | Skill       | Difficulty                                   |
|------------|------|-----------------------------------|-------------|----------------------------------------------|
| PSAT 8/9   | Math | Problem-Solving and Data Analysis | Percentages | <div><div></div><div></div><div></div></div> |

ID: 86174ce1

After **20%** of the original number of marbles in a group were removed from the group, **360** marbles remained in the group. How many marbles were removed from the group?

- A. **72**
- B. **90**
- C. **450**
- D. **1,800**

ID: 86174ce1 Answer

Correct Answer: B

Rationale

Choice B is correct. It's given that 20% of the original number of marbles were removed from the group. Let  $x$  represent the original number of marbles in the group. It follows that  $\frac{20}{100}x$ , or  $0.20x$ , marbles were removed from the group. Therefore,  $x - 0.20x$  marbles remained in the group. It's also given that 360 marbles remained in the group. Thus,  $x - 0.20x = 360$ , or  $0.80x = 360$ . Dividing both sides of this equation by 0.80 yields  $x = 450$ . Substituting 450 for  $x$  in the expression  $0.20x$  yields  $0.20(450)$ , or 90. Therefore, 90 marbles were removed from the group.

Choice A is incorrect. This is 20% of the remaining number of marbles.

Choice C is incorrect. This is the original number of marbles, not the number of marbles that were removed.

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

Question Difficulty: Hard

# Question ID ede40c38

| Assessment | Test | Domain                            | Skill       | Difficulty                                   |
|------------|------|-----------------------------------|-------------|----------------------------------------------|
| PSAT 8/9   | Math | Problem-Solving and Data Analysis | Percentages | <div><div></div><div></div><div></div></div> |

ID: ede40c38

The number of zebras in a population in **2018** was **1.27** times the number of zebras in this population in **2014**. If the number of zebras in this population in **2014** is  $p\%$  of the number of zebras in this population in **2018**, what is the value of  $p$ , to the nearest whole number?

ID: ede40c38 Answer

Correct Answer: 79

Rationale

The correct answer is 79. Let  $x$  represent the number of zebras in the population in 2014 and let  $y$  represent the number of zebras in the population in 2018. It's given that the number of zebras in this population in 2018 was 1.27 times the number of zebras in this population in 2014. It follows that the equation  $y = 1.27x$  represents this situation. Dividing both sides of this equation by 1.27 yields  $\frac{y}{1.27} = x$ , or  $\frac{1}{1.27}y = x$ . Therefore, the number of zebras in this population in 2014 is  $\frac{1}{1.27}$  times the number of zebras in this population in 2018. If the number of zebras in this population in 2014 is  $p\%$  of the number of zebras in this population in 2018, then  $x = \frac{p}{100}y$ . It follows that  $\frac{1}{1.27} = \frac{p}{100}$ , or  $\frac{100}{1.27} = p$ , which means  $p$  is approximately equal to 78.74. Therefore, the value of  $p$ , to the nearest whole number, is 79.

Question Difficulty: Hard

# Question ID 004f2999

| Assessment | Test | Domain                            | Skill       | Difficulty                                   |
|------------|------|-----------------------------------|-------------|----------------------------------------------|
| PSAT 8/9   | Math | Problem-Solving and Data Analysis | Percentages | <div><div></div><div></div><div></div></div> |

ID: 004f2999

The amount of Hanna's bill for a food order was **\$50**. Hanna gave a tip of **20%** of the amount of the bill. What is the amount, in dollars, of the tip Hanna gave?

ID: 004f2999 Answer

Correct Answer: 10

Rationale

The correct answer is 10. It's given that the amount of Hanna's food order was \$ 50 and that Hanna gave a tip of 20% of the amount of the bill. 20% of 50 can be calculated as  $\frac{20}{100}50$ , which yields  $\frac{1000}{100}$ , or 10. Therefore, the amount, in dollars, of the tip Hanna gave is 10.

Question Difficulty: Hard

Question ID b544e3e7

| Assessment | Test | Domain                            | Skill       | Difficulty                                   |
|------------|------|-----------------------------------|-------------|----------------------------------------------|
| PSAT 8/9   | Math | Problem-Solving and Data Analysis | Percentages | <div><div></div><div></div><div></div></div> |

ID: b544e3e7

The table summarizes the number of objects in each group.

| Group | Number of objects |
|-------|-------------------|
| A     | 375               |
| B     | 54                |
| C     | 690               |
| D     | 81                |
| Total | 1,200             |

The number of objects in group C is  $p\%$  of the number of objects in group A. What is the value of  $p$ ?

ID: b544e3e7 Answer

Correct Answer: 184

Rationale

The correct answer is 184. It's given in the table that there are 375 objects in group A and 690 objects in group C. It's also given that the number of objects in group C is  $p\%$  of the number of objects in group A. Therefore, 690 is  $p\%$  of 375, which can be represented by  $690 = \frac{p}{100}375$ , or  $690 = 3.75p$ . Dividing both sides of this equation by 3.75 yields  $184 = p$ . Therefore, the value of  $p$  is 184.

Question Difficulty: Hard

# Question ID de335e2c

| Assessment | Test | Domain                            | Skill       | Difficulty                                   |
|------------|------|-----------------------------------|-------------|----------------------------------------------|
| PSAT 8/9   | Math | Problem-Solving and Data Analysis | Percentages | <div><div></div><div></div><div></div></div> |

ID: de335e2c

Which expression represents the result of increasing a positive quantity  $w$  by 43%?

- A.  $1.43w$
- B.  $0.57w$
- C.  $43w$
- D.  $0.43w$

ID: de335e2c Answer

Correct Answer: A

Rationale

Choice A is correct. The result of increasing a positive quantity  $w$  by  $x\%$  can be represented by the expression  $1 + \frac{x}{100}w$ . Therefore, the result of increasing a positive quantity  $w$  by 43% can be found by substituting 43 for  $x$  in the expression  $1 + \frac{x}{100}w$ , which gives  $1 + \frac{43}{100}w$ , or  $1.43w$ . Thus, the expression  $1.43w$  represents the result of increasing a positive quantity  $w$  by 43%.

Choice B is incorrect. This is the result of decreasing a positive quantity  $w$  by 43%.

Choice C is incorrect. This is the result of increasing a positive quantity  $w$  by 4,200%.

Choice D is incorrect. This is the result of decreasing a positive quantity  $w$  by 57%.

Question Difficulty: Hard

# Question ID e308945a

| Assessment | Test | Domain                            | Skill       | Difficulty                                   |
|------------|------|-----------------------------------|-------------|----------------------------------------------|
| PSAT 8/9   | Math | Problem-Solving and Data Analysis | Percentages | <div><div></div><div></div><div></div></div> |

ID: e308945a

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: e308945a 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  $0.30 \cdot 4x$ , 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: Hard

# Question ID f7f7857d

| Assessment | Test | Domain                            | Skill       | Difficulty                                   |
|------------|------|-----------------------------------|-------------|----------------------------------------------|
| PSAT 8/9   | Math | Problem-Solving and Data Analysis | Percentages | <div><div></div><div></div><div></div></div> |

ID: f7f7857d

In 2008, Zinah earned 14% more than in 2007, and in 2009 Zinah earned 4% more than in 2008. If Zinah earned  $y$  times as much in 2009 as in 2007, what is the value of  $y$ ?

- A. 0.5600
- B. 1.0056
- C. 1.1800
- D. 1.1856

ID: f7f7857d Answer

Correct Answer: D

Rationale

Choice D is correct. It's given that in 2008 Zinah earned 14% more than in 2007. Let  $h$  represent the amount Zinah earned in 2007 and let  $j$  represent the amount that Zinah earned in 2008. This situation can be represented by the equation  $j = 1 + \frac{14}{100}h$ , or  $j = 1.14h$ . It's also given that in 2009 Zinah earned 4% more than in 2008. Let  $k$  represent the amount Zinah earned in 2009. This situation can be represented by the equation  $k = 1 + \frac{4}{100}j$ , or  $k = 1.04j$ . Substituting  $1.14h$  for  $j$  in the equation  $k = 1.04j$  yields  $k = 1.04(1.14h)$ , or  $k = 1.1856h$ . If Zinah earned  $y$  times as much in 2009 as in 2007, then the value of  $y$  is 1.1856.

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

Question Difficulty: Hard

# Question ID c8ca50d3

| Assessment | Test | Domain                            | Skill       | Difficulty                                   |
|------------|------|-----------------------------------|-------------|----------------------------------------------|
| PSAT 8/9   | Math | Problem-Solving and Data Analysis | Percentages | <div><div></div><div></div><div></div></div> |

ID: c8ca50d3

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: c8ca50d3 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 0.00001140, or 0.0014. Note that .0014 and 0.001 are examples of ways to enter a correct answer.

Question Difficulty: Hard

# Question ID e4a98693

| Assessment | Test | Domain                            | Skill       | Difficulty                                   |
|------------|------|-----------------------------------|-------------|----------------------------------------------|
| PSAT 8/9   | Math | Problem-Solving and Data Analysis | Percentages | <div><div></div><div></div><div></div></div> |

ID: e4a98693

432 is 96% of what number?

ID: e4a98693 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  $\frac{96}{100}x = 432$ , or  $0.96x = 432$ . Dividing both sides of this equation by 0.96 yields  $x = 450$ . Therefore, 432 is 96% of 450.

Question Difficulty: Hard

# Question ID bfc9027d

| Assessment | Test | Domain                            | Skill       | Difficulty                                   |
|------------|------|-----------------------------------|-------------|----------------------------------------------|
| PSAT 8/9   | Math | Problem-Solving and Data Analysis | Percentages | <div><div></div><div></div><div></div></div> |

ID: bfc9027d

The number  $a$  is 190% greater than the number  $b$ . The number  $b$  is 80% less than 24. What is the value of  $a$ ?

- A. 9.12
- B. 13.92
- C. 26.40
- D. 36.48

ID: bfc9027d Answer

Correct Answer: B

Rationale

Choice B is correct. It's given that the number  $b$  is 80% less than 24. It follows that  $b$  is equal to 24 minus 80% of 24, which can be written as  $b = 24 - \frac{80}{100}24$ . This is equivalent to  $b = 24 - 0.824$ , or  $b = 4.8$ . It's also given that the number  $a$  is 190% greater than the number  $b$ . It follows that  $a$  is equal to  $b$  plus 190% of  $b$ . Since  $b = 4.8$ , this can be written as  $a = 4.8 + \frac{190}{100}4.8$ . This is equivalent to  $a = 4.8 + 1.94.8$ , or  $a = 13.92$ .

Choice A is incorrect. This would be the value of  $a$  if  $a$  were 190% of  $b$ , not 190% greater than  $b$ .

Choice C is incorrect. This is 190 - 80% of 24.

Choice D is incorrect. This would be the value of  $a$  if  $b$  were 80% of 24, not 80% less than 24, and  $a$  were 190% of  $b$ , not 190% greater than  $b$ .

Question Difficulty: Hard

# Question ID a307eb9f

| Assessment | Test | Domain                            | Skill       | Difficulty                                   |
|------------|------|-----------------------------------|-------------|----------------------------------------------|
| PSAT 8/9   | Math | Problem-Solving and Data Analysis | Percentages | <div><div></div><div></div><div></div></div> |

ID: a307eb9f

The regular price of a shirt at a store is **\$11.70**. The sale price of the shirt is **80%** less than the regular price, and the sale price is **30%** greater than the store's cost for the shirt. What was the store's cost, in dollars, for the shirt? (Disregard the \$ sign when entering your answer. For example, if your answer is **\$4.97**, enter **4.97**)

ID: a307eb9f Answer

Correct Answer: 1.8, 9/5

Rationale

The correct answer is 1.8. It's given that the regular price of a shirt at a store is \$ 11.70, and the sale price of the shirt is 80% less than the regular price. It follows that the sale price of the shirt is  $\$ 11.701 - \frac{80}{100}$ , or  $\$ 11.701 - 0.8$ , which is equivalent to \$ 2.34. It's also given that the sale price of the shirt is 30% greater than the store's cost for the shirt. Let  $x$  represent the store's cost for the shirt. It follows that  $2.34 = 1 + \frac{30}{100}x$ , or  $2.34 = 1.3x$ . Dividing both sides of this equation by 1.3 yields  $x = 1.80$ . Therefore, the store's cost, in dollars, for the shirt is 1.80. Note that 1.8 and 9/5 are examples of ways to enter a correct answer.

Question Difficulty: Hard

# Question ID 3310d2fb

| Assessment | Test | Domain                            | Skill       | Difficulty                                   |
|------------|------|-----------------------------------|-------------|----------------------------------------------|
| PSAT 8/9   | Math | Problem-Solving and Data Analysis | Percentages | <div><div></div><div></div><div></div></div> |

ID: 3310d2fb

Last year, Cedric had **35** plants in his garden. This year, the number of plants in Cedric’s garden is **60%** greater than the number of plants in his garden last year. How many plants does Cedric have in his garden this year?

ID: 3310d2fb Answer

Correct Answer: 56

Rationale

The correct answer is 56. It’s given that Cedric had 35 plants in his garden last year and that the number of plants in Cedric's garden this year is 60% greater than the number of plants in his garden last year. It follows that the number of plants in Cedric’s garden this year is 35 plus 60% of 35, which is equal to  $35 + 35 \frac{60}{100}$ , or  $35 + 350.6$ . This expression is equivalent to  $35 + 21$ , or 56. Therefore, Cedric has 56 plants in his garden this year.

Question Difficulty: Hard

# Question ID 1bddbd65

| Assessment | Test | Domain                            | Skill       | Difficulty                                   |
|------------|------|-----------------------------------|-------------|----------------------------------------------|
| PSAT 8/9   | Math | Problem-Solving and Data Analysis | Percentages | <div><div></div><div></div><div></div></div> |

ID: 1bddbd65

210 is  $p\%$  greater than 30. What is the value of  $p$ ?

ID: 1bddbd65 Answer

Correct Answer: 600

Rationale

The correct answer is 600. It's given that 210 is  $p\%$  greater than 30. It follows that  $210 = 1 + \frac{p}{100}30$ . Dividing both sides of this equation by 30 yields  $7 = 1 + \frac{p}{100}$ . Subtracting 1 from both sides of this equation yields  $6 = \frac{p}{100}$ . Multiplying both sides of this equation by 100 yields  $p = 600$ . Therefore, the value of  $p$  is 600.

Question Difficulty: Hard

# Question ID 24e7f289

| Assessment | Test | Domain                            | Skill       | Difficulty                                   |
|------------|------|-----------------------------------|-------------|----------------------------------------------|
| PSAT 8/9   | Math | Problem-Solving and Data Analysis | Percentages | <div><div></div><div></div><div></div></div> |

ID: 24e7f289

The expression  $0.35x$  represents the result of decreasing a positive quantity  $x$  by what percent?

- A. 3.5%
- B. 35%
- C. 6.5%
- D. 65%

ID: 24e7f289 Answer

Correct Answer: D

Rationale

Choice D is correct. Let  $n\%$  represent the percent by which the positive quantity  $x$  is decreased to result in  $0.35x$ . The value of  $n$  can be found by solving the equation  $x - \frac{n}{100}x = 0.35x$ . Since  $x$  is a common factor of each of the terms on the left-hand side of this equation, the equation can be rewritten as  $x1 - \frac{n}{100} = 0.35x$ . Dividing each side of this equation by  $x$  yields  $1 - \frac{n}{100} = 0.35$ . Multiplying each side of this equation by 100 yields  $100 - n = 35$ . Subtracting 100 from each side of this equation yields  $-n = -65$ . Dividing each side of this equation by -1 yields  $n = 65$ . Therefore, the expression  $0.35x$  represents the result of decreasing the positive quantity  $x$  by 65%.

Choice A is incorrect. Decreasing the quantity  $x$  by 3.5% yields  $x - 0.035x$ , or  $0.965x$ , not  $0.35x$ .

Choice B is incorrect. Decreasing the quantity  $x$  by 35% yields  $x - 0.35x$ , or  $0.65x$ , not  $0.35x$ .

Choice C is incorrect. Decreasing the quantity  $x$  by 6.5% yields  $x - 0.065x$ , or  $0.935x$ , not  $0.35x$ .

Question Difficulty: Hard

# Question ID 5101d922

| Assessment | Test | Domain                            | Skill       | Difficulty                                   |
|------------|------|-----------------------------------|-------------|----------------------------------------------|
| PSAT 8/9   | Math | Problem-Solving and Data Analysis | Percentages | <div><div></div><div></div><div></div></div> |

ID: 5101d922

There are **450** tiles in a box. Of these tiles, **6%** are black. How many black tiles are in the box?

ID: 5101d922 Answer

Correct Answer: 27

Rationale

The correct answer is 27. It’s given that 6% of the 450 tiles in a box are black. Therefore, the number of black tiles in the box can be calculated by multiplying the number of tiles in the box by  $\frac{6}{100}$ , which is equivalent to  $450\frac{6}{100}$ , or 27.

Question Difficulty: Hard

# Question ID 08c0b207

| Assessment | Test | Domain                            | Skill       | Difficulty                                   |
|------------|------|-----------------------------------|-------------|----------------------------------------------|
| PSAT 8/9   | Math | Problem-Solving and Data Analysis | Percentages | <div><div></div><div></div><div></div></div> |

ID: 08c0b207

140 is  $p\%$  greater than 10. What is the value of  $p$ ?

- A. 1,400
- B. 1,300
- C. 140
- D. 130

ID: 08c0b207 Answer

Correct Answer: B

Rationale

Choice B is correct. It's given that 140 is  $p\%$  greater than 10. It follows that  $140 = 10 + \frac{p}{100}10$ , which is equivalent to  $140 = 10 + \frac{10}{100}p$ , or  $140 = 10 + 0.1p$ . Subtracting 10 from each side of this equation yields  $130 = 0.1p$ . Dividing each side of this equation by 0.1 yields  $1,300 = p$ , or  $p = 1,300$ .

Choice A is incorrect. This would be the value of  $p$  if 140 were  $p\%$  of 10, not  $p\%$  greater than 10.

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: Hard

# Question ID 53b754ac

| Assessment | Test | Domain                            | Skill       | Difficulty                                   |
|------------|------|-----------------------------------|-------------|----------------------------------------------|
| PSAT 8/9   | Math | Problem-Solving and Data Analysis | Percentages | <div><div></div><div></div><div></div></div> |

ID: 53b754ac

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: 53b754ac 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,  $a = 1 - \frac{70}{100}b$ , which is equivalent to  $a = 1 - 0.70b$ , or  $a = 0.30b$ . It's also given that the number  $c$  is 80% greater than  $a$ . Therefore,  $c = 1 + \frac{80}{100}a$ , which is equivalent to  $c = 1 + 0.80a$ , 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 049d8d4e

| Assessment | Test | Domain                            | Skill       | Difficulty                                   |
|------------|------|-----------------------------------|-------------|----------------------------------------------|
| PSAT 8/9   | Math | Problem-Solving and Data Analysis | Percentages | <div><div></div><div></div><div></div></div> |

ID: 049d8d4e

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: 049d8d4e 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  $100\frac{0.942502x}{x}$ , 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 801aa14c

| Assessment | Test | Domain                            | Skill       | Difficulty                                   |
|------------|------|-----------------------------------|-------------|----------------------------------------------|
| PSAT 8/9   | Math | Problem-Solving and Data Analysis | Percentages | <div><div></div><div></div><div></div></div> |

ID: 801aa14c

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: 801aa14c 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,  $a = 1 + \frac{60}{100}b$ , which is equivalent to  $a = 1 + 0.60b$ , or  $a = 1.60b$ . It's also given that the number  $c$  is 45% less than  $a$ . Therefore,  $c = 1 - \frac{45}{100}a$ , which is equivalent to  $c = 1 - 0.45a$ , 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 a2f38d36

| Assessment | Test | Domain                            | Skill       | Difficulty                                   |
|------------|------|-----------------------------------|-------------|----------------------------------------------|
| PSAT 8/9   | Math | Problem-Solving and Data Analysis | Percentages | <div><div></div><div></div><div></div></div> |

ID: a2f38d36

The number  $a$  is 110% greater than the number  $b$ . The number  $b$  is 90% less than 47. What is the value of  $a$ ?

ID: a2f38d36 Answer

Correct Answer: 9.87, 987/100

Rationale

The correct answer is 9.87. It's given that the number  $a$  is 110% greater than the number  $b$ . It follows that  $a = 1 + \frac{110}{100}b$ , or  $a = 2.1b$ . It's also given that the number  $b$  is 90% less than 47. It follows that  $b = 1 - \frac{90}{100}47$ , or  $b = 0.147$ , which yields  $b = 4.7$ . Substituting 4.7 for  $b$  in the equation  $a = 2.1b$  yields  $a = 2.1(4.7)$ , which is equivalent to  $a = 9.87$ . Therefore, the value of  $a$  is 9.87.

Question Difficulty: Hard

# Question ID 2e0adfc9

| Assessment | Test | Domain                            | Skill       | Difficulty                                   |
|------------|------|-----------------------------------|-------------|----------------------------------------------|
| PSAT 8/9   | Math | Problem-Solving and Data Analysis | Percentages | <div><div></div><div></div><div></div></div> |

ID: 2e0adfc9

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: 2e0adfc9 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  $z = 1.13100$ , which is equivalent to  $z = 1 + 0.13 ( 100 )$ , or  $z = 1 + \frac{13}{100}100$ . 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: Hard

# Question ID cc0f545f

| Assessment | Test | Domain                            | Skill       | Difficulty                                   |
|------------|------|-----------------------------------|-------------|----------------------------------------------|
| PSAT 8/9   | Math | Problem-Solving and Data Analysis | Percentages | <div><div></div><div></div><div></div></div> |

ID: cc0f545f

A reseller buys certain books for a purchase price of **5.00** dollars each and then marks them each for sale at a consumer price that is **270%** of the purchase price. After **4** months, any remaining books not yet sold are marked at a discounted price that is **70%** off the consumer price. What is the discounted price of each of the remaining books, in dollars?

ID: cc0f545f Answer

Correct Answer: 4.05, 81/20

Rationale

The correct answer is 4.05. It's given that the purchase price for certain books is 5.00 dollars each. It's also given that each book is marked for sale at a consumer price that is 270% of the purchase price. Since the consumer price is 270% of the purchase price of 5.00 dollars, it follows that the consumer price is  $(2.7)(5.00)$ , or 13.50, dollars. It's given that after 4 months, any remaining books are discounted at 70% off the consumer price. Thus, the discount amount is  $(0.7)(13.50)$ , or 9.45, dollars. Subtracting the discount amount from the consumer price gives the discounted price of each of the remaining books:  $13.50 - 9.45 = 4.05$ . Note that 4.05 and 81/20 are examples of ways to enter a correct answer.

Question Difficulty: Hard

# Question ID 227bc381

| Assessment | Test | Domain                            | Skill       | Difficulty                                   |
|------------|------|-----------------------------------|-------------|----------------------------------------------|
| PSAT 8/9   | Math | Problem-Solving and Data Analysis | Percentages | <div><div></div><div></div><div></div></div> |

ID: 227bc381

In March, the price of a collectible card was **\$15.50**. In April, the price of the collectible card was **\$17.36**. The price of the collectible card in April was  $p\%$  of the price of the collectible card in March. What is the value of  $p$ ?

- A. 12
- B. 88
- C. 112
- D. 188

ID: 227bc381 Answer

Correct Answer: C

Rationale

Choice C is correct. It's given that the price of the collectible card was \$ 15.50 in March and \$ 17.36 in April. It's also given that the price of the collectible card in April was  $p\%$  of the price in March. It follows that \$ 17.36 is  $p\%$  of \$ 15.50. Therefore, the value of  $p$  can be calculated by solving the equation  $17.36 = \frac{p}{100}15.50$ , or  $17.36 = \frac{15.50p}{100}$ . Multiplying each side of this equation by 100 yields  $1,736 = 15.50p$ . Dividing each side of this equation by 15.50 yields  $112 = p$ . Therefore, the value of  $p$  is 112.

Choice A is incorrect. 12% is the percent increase in the price of the collectible card from March to April.

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 dddca81d

| Assessment | Test | Domain                            | Skill       | Difficulty                                   |
|------------|------|-----------------------------------|-------------|----------------------------------------------|
| PSAT 8/9   | Math | Problem-Solving and Data Analysis | Percentages | <div><div></div><div></div><div></div></div> |

ID: dddca81d

The population of City A increased by **7%** from **2015** to **2016**. If the **2016** population is ***k*** times the **2015** population, what is the value of ***k***?

- A. **0.07**
- B. **0.7**
- C. **1.07**
- D. **1.7**

ID: dddca81d Answer

Correct Answer: C

Rationale

Choice C is correct. It's given that the population of City A increased by 7% from 2015 to 2016. Therefore, the population of City A in 2016 includes 100% of the population of City A in 2015 plus an additional 7% of the population of City A in 2015. This means that the population of City A in 2016 is 107% of the population in 2015. Thus, the population of City A in 2016 is  $\frac{107}{100}$ , or 1.07, times the 2015 population. Therefore, the value of *k* is 1.07.

Choice A is incorrect. This would be the value of *k* if the population in 2016 was 7% of the population in 2015.

Choice B is incorrect. This would be the value of *k* if the population in 2016 was 70% of the population in 2015.

Choice D is incorrect. This would be the value of *k* if the population increased by 70%, not 7%, from 2015 to 2016.

Question Difficulty: Hard

# Question ID 2dd8d6f9

| Assessment | Test | Domain                            | Skill       | Difficulty                                   |
|------------|------|-----------------------------------|-------------|----------------------------------------------|
| PSAT 8/9   | Math | Problem-Solving and Data Analysis | Percentages | <div><div></div><div></div><div></div></div> |

ID: 2dd8d6f9

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: 2dd8d6f9 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  $w = 1 + \frac{110}{100}z$ , or  $w = 2.1z$ . It's also given that the number  $z$  is 55% less than 50. It follows that  $z = 1 - \frac{55}{100}50$ , or  $z = 0.4550$ , which yields  $z = 22.5$ . Substituting 22.5 for  $z$  in the equation  $w = 2.1z$  yields  $w = 2.122.5$ , 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 9bcaa533

| Assessment | Test | Domain                            | Skill       | Difficulty                                   |
|------------|------|-----------------------------------|-------------|----------------------------------------------|
| PSAT 8/9   | Math | Problem-Solving and Data Analysis | Percentages | <div><div></div><div></div><div></div></div> |

ID: 9bcaa533

In a sample, 80% of the items are faulty. There are 88 faulty items in the sample. How many total items are in the sample?

ID: 9bcaa533 Answer

Correct Answer: 110

Rationale

The correct answer is 110. Let  $x$  represent the total number of items in the sample. It's given that 80% of the items are faulty and that there are 88 faulty items in the sample. Therefore, 80% of  $x$  is 88. Since 80% can be rewritten as  $\frac{80}{100}$ , it follows that  $\frac{80}{100}x = 88$ . Multiplying both sides of this equation by 100 yields  $80x = 8,800$ . Dividing both sides of this equation by 80 yields  $x = 110$ . Therefore, there are 110 total items in the sample.

Question Difficulty: Hard

Question ID 257d9f57

| Assessment | Test | Domain                            | Skill       | Difficulty                                   |
|------------|------|-----------------------------------|-------------|----------------------------------------------|
| PSAT 8/9   | Math | Problem-Solving and Data Analysis | Percentages | <div><div></div><div></div><div></div></div> |

ID: 257d9f57

- The positive number  $a$  is **2,241%** of the sum of the positive numbers  $b$  and  $c$ , and  $b$  is **83%** of  $c$ . What percent of  $b$  is  $a$ ?
- A. **23.24%**
  - B. **49.41%**
  - C. **2,324%**
  - D. **4,941%**

ID: 257d9f57 Answer

Correct Answer: D

Rationale

Choice D is correct. It's given that  $a$  is 2,241% of the sum of  $b$  and  $c$ . This can be represented by the equation  $a = \frac{2,241}{100}b + c$ , or  $a = 22.41b + c$ . It's also given that that  $b$  is 83% of  $c$ . This can be represented by the equation  $b = \frac{83}{100}c$ , or  $b = 0.83c$ . Dividing both sides of this equation by 0.83 yields  $\frac{b}{0.83} = c$ . Substituting  $\frac{b}{0.83}$  for  $c$  in the equation  $a = 22.41b + c$  yields  $a = 22.41b + \frac{b}{0.83}$ , or  $a = 22.41\frac{1.83b}{0.83}$ , which is equivalent to  $a = \frac{41.0103b}{0.83}$ , or  $a = 49.41b$ . This equation is equivalent to  $a = \frac{4,941}{100}b$ ; therefore,  $a$  is 4,941% of  $b$ .

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

Question Difficulty: Hard