

Question ID c9fad009

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Problem-Solving and Data Analysis	Percentages	Hard

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 $a = (1 - 0.70)b$, 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 $c = (1 + 0.60)a$, 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 4e5308ae

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Problem-Solving and Data Analysis	Percentages	Hard

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 $1(115) + 0.4(115)$, or $1.4(115)$, 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	Hard

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	Hard

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 **(0.07)*x***. 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* + (0.07)*x***, or **1.07*x***. 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	Hard

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	Hard

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	Hard

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 $2.67x - (2.67x)(0.16)$, 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

Question ID b7a6f094

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Problem-Solving and Data Analysis	Percentages	Hard

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 $99 = \left(1 + \frac{12.50}{100}\right)x$, 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	Hard

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 **\$7.00(2.9)**, or **\$20.30**. It's also given that the discounted price is **80%** off the retail price. Thus, the discounted price is **\$20.30($1 - \frac{80}{100}$)**, which is equivalent to **\$20.30(0.20)**, or **\$4.06**.

Question Difficulty: Hard

Question ID 90c6099e

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Problem-Solving and Data Analysis	Percentages	Hard

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**($\frac{72}{100}$), 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**($\frac{36}{100}$), 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	Hard

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 $x + \left(\frac{1,800}{100}\right)x = 684$, 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	Hard

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 $x + \left(\frac{400}{100}\right)x = 60$, 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	Hard

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	Hard

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	Hard

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	Hard

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 $690 = \left(\frac{p}{100}\right)(375)$, 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	Hard

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 $\left(1 + \frac{x}{100}\right)w$. Therefore, the result of increasing a positive quantity w by **43%** can be found by substituting **43** for x in the expression $\left(1 + \frac{x}{100}\right)w$, which gives $\left(1 + \frac{43}{100}\right)w$, 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	Hard

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. 4*x***, 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. 4*x*)**, or **0. 12*x***. The expression **0. 12*x*** 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	Hard

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 **$j = \left(1 + \frac{14}{100}\right)h$** , 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 **$k = \left(1 + \frac{4}{100}\right)j$** , 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	Hard

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 **(0.00001)(140)**, or **0.0014**. Note that .0014 and 0.001 are examples of ways to enter a correct answer.

Question Difficulty: Hard

Question ID e4a98693

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Problem-Solving and Data Analysis	Percentages	Hard

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	Hard

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 $b = 24 - 0.8(24)$, 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 $a = 4.8 + 1.9(4.8)$, 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	Hard

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 **$\$11.70(1 - \frac{80}{100})$** , or **$\$11.70(1 - 0.8)$** , 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	Hard

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 **$35 + 35\left(\frac{60}{100}\right)$** , or **$35 + 35(0.6)$** . 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	Hard

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 $210 = \left(1 + \frac{p}{100}\right)(30)$. 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	Hard

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 $x - \left(\frac{n}{100}\right)x = 0.35x$. 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 $x\left(1 - \frac{n}{100}\right) = 0.35x$. 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	Hard

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	Hard

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 $140 = 10 + \left(\frac{p}{100}\right)10$, 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	Hard

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 $a = (1 - 0.70)b$, 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 $c = (1 + 0.80)a$, 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 049d8d4e

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Problem-Solving and Data Analysis	Percentages	Hard

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 $100\left(\frac{0.942502x}{x}\right)$, 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 801aa14c

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Problem-Solving and Data Analysis	Percentages	Hard

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 $a = (1 + 0.60)b$, 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 $c = (1 - 0.45)a$, 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 a2f38d36

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Problem-Solving and Data Analysis	Percentages	Hard

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 $b = 0.1(47)$, 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	Hard

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 $z = (1.13)(100)$, 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	Hard

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	Hard

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	Hard

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	Hard

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 $z = 0.45(50)$, 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 9bcaa533

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Problem-Solving and Data Analysis	Percentages	Hard

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	Hard

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 $a = \left(\frac{2,241}{100}\right)(b + c)$, or $a = 22.41(b + c)$. It's also given that that b is 83% of c . This can be represented by the equation $b = \left(\frac{83}{100}\right)c$, 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 $a = 22.41(b + c)$ yields $a = 22.41\left(b + \frac{b}{0.83}\right)$, or $a = 22.41\left(\frac{1.83b}{0.83}\right)$, which is equivalent to $a = \frac{41.0103b}{0.83}$, or $a = 49.41b$. This equation is equivalent to $a = \left(\frac{4,941}{100}\right)b$; 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