

Question ID b22b77e5

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Algebra	Linear equations in one variable	Hard

ID: b22b77e5

If $5 - 7(2 - 4x) = 16 - 8(2 - 4x)$, what is the value of $2 - 4x$?

ID: b22b77e5 Answer

Correct Answer: 11

Rationale

The correct answer is **11**. Subtracting **5** from each side of the given equation yields $-7(2 - 4x) = 11 - 8(2 - 4x)$. Adding $8(2 - 4x)$ to each side of this equation yields $2 - 4x = 11$. Therefore, the value of $2 - 4x$ is **11**.

Question Difficulty: Hard

Question ID 87277ccb

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Algebra	Linear equations in one variable	Hard

ID: 87277ccb

If $\frac{x+6}{3} = \frac{x+6}{13}$, the value of $x + 6$ is between which of the following pairs of values?

- A. -7 and -3
- B. -2 and 2
- C. 2 and 7
- D. 8 and 13

ID: 87277ccb Answer

Correct Answer: B

Rationale

Choice B is correct. Multiplying both sides of the given equation by $(3)(13)$, or 39 , yields $(39)\left(\frac{x+6}{3}\right) = (39)\left(\frac{x+6}{13}\right)$, or $13(x + 6) = 3(x + 6)$. Subtracting $3(x + 6)$ from both sides of this equation yields $10(x + 6) = 0$. Dividing both sides of this equation by 10 yields $x + 6 = 0$. Therefore, if $\frac{x+6}{3} = \frac{x+6}{13}$, then the value of $x + 6$ is 0 . It follows that of the given choices, the value of $x + 6$ is between -2 and 2 .

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

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

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

Question Difficulty: Hard

Question ID 019d6a10

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Algebra	Linear equations in one variable	Hard

ID: 019d6a10

$$5(t + 3) - 7(t + 3) = 38$$

What value of t is the solution to the given equation?

ID: 019d6a10 Answer

Correct Answer: -22

Rationale

The correct answer is -22 . The given equation can be rewritten as $-2(t + 3) = 38$. Dividing both sides of this equation by -2 yields $t + 3 = -19$. Subtracting 3 from both sides of this equation yields $t = -22$. Therefore, -22 is the value of t that is the solution to the given equation.

Question Difficulty: Hard

Question ID 8f5aa705

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Algebra	Linear equations in one variable	Hard

ID: 8f5aa705

If $5(x + 4) = 4(x + 4) + 29$, what is the value of $x + 4$?

- A. -4
- B. 25
- C. 29
- D. 33

ID: 8f5aa705 Answer

Correct Answer: C

Rationale

Choice C is correct. Subtracting $4(x + 4)$ from both sides of the given equation yields $1(x + 4) = 29$, or $x + 4 = 29$. Therefore, the value of $x + 4$ is 29 .

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

Choice B is incorrect. This is the value of x , not $x + 4$.

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

Question Difficulty: Hard

Question ID 70b4888c

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Algebra	Linear equations in one variable	Hard

ID: 70b4888c

What value of t is the solution to the equation $0.8t - 0.46 = 8(t - 0.001) + 1.9$?

ID: 70b4888c Answer

Correct Answer: -.3266, -.3267, -49/150

Rationale

The correct answer is $-.3267$. Applying the distributive property to the right-hand side of the given equation yields $0.8t - 0.46 = 8t - 0.008 + 1.9$, or $0.8t - 0.46 = 8t + 1.892$. Subtracting $0.8t$ from both sides of this equation yields $-0.46 = 7.2t + 1.892$. Subtracting 1.892 from both sides of this equation yields $-2.352 = 7.2t$. Dividing both sides of this equation by 7.2 yields $\frac{-2.352}{7.2} = t$. Therefore, the value of t is approximately -0.32667 . Note that -.3267, -.3266, -0.326, and -0.327 are examples of ways to enter a correct answer.

Question Difficulty: Hard

Question ID f482a8e9

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Algebra	Linear equations in one variable	Hard

ID: f482a8e9

A line segment that has a length of **115 centimeters (cm)** is divided into three parts. One part is **47 cm** long. The other two parts have lengths that are equal to each other. What is the length, in **cm**, of one of the other two parts of equal length?

ID: f482a8e9 Answer

Correct Answer: 34

Rationale

The correct answer is **34**. It's given that a line segment has a length of **115 cm** and is divided into three parts, where one part is **47 cm** long and the other two parts have lengths that are equal. If x represents the length, in cm, of each of the two parts of equal length, then the equation $47 + x + x = 115$, or $47 + 2x = 115$, represents this situation. Subtracting **47** from each side of this equation yields $2x = 68$. Dividing each side of this equation by **2** yields $x = 34$. Therefore, the length, in cm, of one of the two parts of equal length is **34**.

Question Difficulty: Hard

Question ID b4b0cd06

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Algebra	Linear equations in one variable	Hard

ID: b4b0cd06

$-49x = -98x$

How many solutions does the given equation have?

- A. Zero
- B. Exactly one
- C. Exactly two
- D. Infinitely many

ID: b4b0cd06 Answer

Correct Answer: B

Rationale

Choice B is correct. Adding $98x$ to each side of the given equation yields $49x = 0$. Dividing each side of this equation by 49 yields $x = 0$. This means that 0 is the only solution to the given equation. Therefore, the given equation has exactly one solution.

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

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

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

Question Difficulty: Hard

Question ID a0ee88cc

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Algebra	Linear equations in one variable	Hard

ID: a0ee88cc

If $\frac{x-5}{7} = \frac{x-5}{9}$, the value of $x - 5$ is between which of the following pairs of values?

- A. -9 and -7
- B. -3 and 3
- C. 4.5 and 5.5
- D. 6.75 and 9.25

ID: a0ee88cc Answer

Correct Answer: B

Rationale

Choice B is correct. Multiplying both sides of the given equation by $(7)(9)$, or 63 , yields $(63)\left(\frac{x-5}{7}\right) = (63)\left(\frac{x-5}{9}\right)$, or $9(x - 5) = 7(x - 5)$. Subtracting $7(x - 5)$ from both sides of this equation yields $2(x - 5) = 0$. Dividing both sides of this equation by 2 yields $x - 5 = 0$. Therefore, if $\frac{x-5}{7} = \frac{x-5}{9}$, then the value of $x - 5$ is 0 . It follows that of the given choices, the value of $x - 5$ is between -3 and 3 .

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

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

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

Question Difficulty: Hard

Question ID 3641c447

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Algebra	Linear equations in one variable	Hard

ID: 3641c447

If $2(3t - 10) + t = 40 + 4t$, what is the value of $3t$?

ID: 3641c447 Answer

Correct Answer: 60

Rationale

The correct answer is **60**. Subtracting t from both sides of the given equation yields $2(3t - 10) = 40 + 3t$. Applying the distributive property to the left-hand side of this equation yields $6t - 20 = 40 + 3t$. Adding **20** to both sides of this equation yields $6t = 60 + 3t$. Subtracting $3t$ from both sides of this equation yields $3t = 60$. Therefore, the value of $3t$ is **60**.

Question Difficulty: Hard

Question ID d184436c

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Algebra	Linear equations in one variable	Hard

ID: d184436c

$$\frac{1}{3}(x + 6) - \frac{1}{2}(x + 6) = -8$$

What value of x is the solution to the given equation?

ID: d184436c Answer

Correct Answer: 42

Rationale

The correct answer is **42**. The expression $(x + 6)$ is a factor of both terms on the left-hand side of the given equation. Therefore, the given equation can be written as $(x + 6)\left(\frac{1}{3} - \frac{1}{2}\right) = -8$, or $(x + 6)\left(-\frac{1}{6}\right) = -8$. Multiplying each side of this equation by -6 yields $x + 6 = 48$. Subtracting **6** from each side of this equation yields $x = 42$. Therefore, the value of x that is the solution to the given equation is **42**.

Question Difficulty: Hard

Question ID 53438dc8

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Algebra	Linear equations in one variable	Hard

ID: 53438dc8

$$4x + 12 = \frac{a(x+3)}{2}$$

In the given equation, a is a constant. If the equation has infinitely many solutions, what is the value of a ?

- A. 0
- B. 3
- C. 8
- D. 12

ID: 53438dc8 Answer

Correct Answer: C

Rationale

Choice C is correct. If an equation has infinitely many solutions, then the two sides of the equation must be equivalent. Multiplying each side of the given equation by 2 yields $8x + 24 = a(x + 3)$. Since 8 is a common factor of both terms on the left-hand side of this equation, the equation can be rewritten as $8(x + 3) = a(x + 3)$. The two sides of this equation are equivalent when $a = 8$. Therefore, if the given equation has infinitely many solutions, the value of a is 8.

Alternate approach: If the given equation, $4x + 12 = \frac{a(x+3)}{2}$, has infinitely many solutions, then both sides of this equation are equal for any value of x . If $x = 0$, then substituting 0 for x in the given equation yields $4(0) + 12 = \frac{a(0+3)}{2}$, or $12 = \frac{3}{2}a$. Dividing both sides of this equation by $\frac{3}{2}$ yields $8 = a$.

Choice A is incorrect. If the value of a is 0, the given equation is equivalent to $4x + 12 = 0$, which has one solution, not infinitely many solutions.

Choice B is incorrect. If the value of a is 3, the given equation is equivalent to $4x + 12 = \frac{3(x+3)}{2}$, or $4x + 12 = \frac{3}{2}x + \frac{9}{2}$, which has one solution, not infinitely many solutions.

Choice D is incorrect. If the value of a is 12, the given equation is equivalent to $4x + 12 = \frac{12(x+3)}{2}$, or $4x + 12 = 6x + 18$, which has one solution, not infinitely many solutions.

Question Difficulty: Hard

Question ID 681ea2fa

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Algebra	Linear equations in one variable	Hard

ID: 681ea2fa

If $46 = 16 + 2(x - 8)$, what is the value of $2(x - 8)$?

- A. 16
- B. 23
- C. 30
- D. 38

ID: 681ea2fa Answer

Correct Answer: C

Rationale

Choice C is correct. Subtracting **16** from both sides of the given equation yields $30 = 2(x - 8)$. Therefore, the value of $2(x - 8)$ is **30**.

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 cd9ded9a

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Algebra	Linear equations in one variable	Hard

ID: cd9ded9a

The cost to rent a commercial fishing boat from a certain company is \$950 for the first 2 hours and an additional \$50 per hour for each hour after the first 2 hours. If the total cost to rent the commercial fishing boat from the company for t hours, where $t > 2$, is \$1,100, which equation represents this situation?

- A. $950(t - 2) + 50t = 1,100$
- B. $950(2t) + 50t = 1,100$
- C. $950 + 50(t - 2) = 1,100$
- D. $950 + 50(2t) = 1,100$

ID: cd9ded9a Answer

Correct Answer: C

Rationale

Choice C is correct. It's given that the cost to rent a commercial fishing boat is \$950 for the first 2 hours and an additional \$50 per hour for each hour after the first 2 hours. It's also given that t represents the total number of hours and $t > 2$. Therefore, the number of additional hours after the first 2 hours can be represented with the expression $t - 2$. The cost for these additional hours is \$50 per hour, so the cost for the additional hours can be represented by the expression $50(t - 2)$. The total cost can be calculated by adding the cost for the first 2 hours to the cost for the additional hours and can be represented by the expression $950 + 50(t - 2)$. It's also given that the total cost to rent the commercial fishing boat from the company for t hours is \$1,100. Thus, the equation that represents this situation is $950 + 50(t - 2) = 1,100$.

Choice A is incorrect and may result from conceptual errors.

Choice B is incorrect and may result from conceptual errors.

Choice D is incorrect and may result from conceptual errors.

Question Difficulty: Hard

Question ID e8136b69

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Algebra	Linear equations in one variable	Hard

ID: e8136b69

$$\frac{12x+28}{4} - \frac{s}{13} = r(x - 8)$$

In the given equation, s and r are constants, and $s > 0$. If the equation has infinitely many solutions, what is the value of s ?

ID: e8136b69 Answer

Correct Answer: 403

Rationale

The correct answer is **403**. For a linear equation in one variable to have infinitely many solutions, the coefficients of the variable must be equal on both sides of the equation and the constant terms must also be equal on both sides of the equation. The given equation can be rewritten as $\frac{4(3x+7)}{4} - \frac{s}{13} = r(x - 8)$, or $3x + 7 - \frac{s}{13} = r(x - 8)$. Applying the distributive property to the right-hand side of this equation yields $3x + 7 - \frac{s}{13} = rx - 8r$. For this equation to have infinitely many solutions, the coefficients of x must be equal, so it follows that $3 = r$. Additionally, the constant terms must be equal, which means $7 - \frac{s}{13} = -8r$. Substituting 3 for r in this equation yields $7 - \frac{s}{13} = -8(3)$, or $7 - \frac{s}{13} = -24$. Adding $\frac{s}{13}$ to both sides of this equation yields $7 = -24 + \frac{s}{13}$. Adding 24 to both sides of this equation yields $31 = \frac{s}{13}$. Multiplying both sides of this equation by 13 yields $403 = s$. Therefore, if the equation has infinitely many solutions, the value of s is **403**.

Question Difficulty: Hard

Question ID 3dcf6a65

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Algebra	Linear equations in one variable	Hard

ID: 3dcf6a65

A bowl contains **20** ounces of water. When the bowl is uncovered, the amount of water in the bowl decreases by **1** ounce every **4** days. If **9** ounces of water remain in this bowl, for how many days has it been uncovered?

- A. **3**
- B. **7**
- C. **36**
- D. **44**

ID: 3dcf6a65 Answer

Correct Answer: D

Rationale

Choice D is correct. It's given that the bowl starts with **20** ounces of water and has **9** ounces of water remaining after a period of time has passed. The amount of water the bowl has lost during the time period can be found by subtracting the remaining amount of water from the amount of water the bowl starts with, which yields **20 — 9** ounces, or **11** ounces. This means the bowl loses **11** ounces of water during that period of time. It's given that the amount of water decreases by **1** ounce every **4** days. Letting *t* represent the number of days the bowl has been uncovered, it follows that $\frac{1}{4} = \frac{11}{t}$. Multiplying both sides of this equation by **4t** yields *t* = **44**. Therefore, the bowl has been uncovered for **44** days.

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. This is the value of *t* for the equation $\frac{1}{4} = \frac{9}{t}$, not $\frac{1}{4} = \frac{11}{t}$.

Question Difficulty: Hard

Question ID c7d8a4ee

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Algebra	Linear equations in one variable	Hard

ID: c7d8a4ee

A candle is made of **17** ounces of wax. When the candle is burning, the amount of wax in the candle decreases by **1** ounce every **4** hours. If **6** ounces of wax remain in this candle, for how many hours has it been burning?

- A. **3**
- B. **6**
- C. **24**
- D. **44**

ID: c7d8a4ee Answer

Correct Answer: D

Rationale

Choice D is correct. It's given that the candle starts with **17** ounces of wax and has **6** ounces of wax remaining after a period of time has passed. The amount of wax the candle has lost during the time period can be found by subtracting the remaining amount of wax from the amount of wax the candle was made of, which yields **17 – 6** ounces, or **11** ounces. This means the candle loses **11** ounces of wax during that period of time. It's given that the amount of wax decreases by **1** ounce every **4** hours. If ***h*** represents the number of hours the candle has been burning, it follows that $\frac{1}{4} = \frac{11}{h}$. Multiplying both sides of this equation by **4*h*** yields ***h* = 44**. Therefore, the candle has been burning for **44** hours.

Choice A is incorrect and may result from using the equation $\frac{1}{4} = \frac{h}{11}$ rather than $\frac{1}{4} = \frac{11}{h}$ to represent the situation, and then rounding to the nearest whole number.

Choice B is incorrect. This is the amount of wax, in ounces, remaining in the candle, not the number of hours it has been burning.

Choice C is incorrect and may result from using the equation $\frac{1}{4} = \frac{6}{h}$ rather than $\frac{1}{4} = \frac{11}{h}$ to represent the situation.

Question Difficulty: Hard

Question ID a521b123

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Algebra	Linear equations in one variable	Hard

ID: a521b123

A factory makes 9-inch, 7-inch, and 4-inch concrete screws. During a certain day, the number of 9-inch concrete screws that the factory makes is 5 times the number n of 7-inch concrete screws, and the number of 4-inch concrete screws is 22. During this day, the factory makes 100 concrete screws total. Which equation represents this situation?

- A. $9(5n) + 7n + 4(22) = 100$
- B. $9n + 7n + 4n = 100$
- C. $5n + 22 = 100$
- D. $6n + 22 = 100$

ID: a521b123 Answer

Correct Answer: D

Rationale

Choice D is correct. It's given that during a certain day at a factory, the number of 7-inch concrete screws the factory makes is n and the number of 4-inch concrete screws the factory makes is 22. It's also given that during this day the number of 9-inch concrete screws the factory makes is 5 times the number of 7-inch concrete screws, or $5n$. Therefore, the total number of 7-inch, 9-inch, and 4-inch concrete screws is $n + 5n + 22$, or $6n + 22$. It's given that during this day, the factory makes 100 concrete screws total. Thus, the equation $6n + 22 = 100$ represents this situation.

Choice A is incorrect. This equation represents a situation where the total length, in inches, of all the concrete screws, rather than the total number of concrete screws, is 100.

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

Choice C is incorrect. This equation represents a situation where the total number of 9-inch concrete screws and 4-inch concrete screws, not including the 7-inch concrete screws, is 100.

Question Difficulty: Hard

Question ID ca8a54ef

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Algebra	Linear equations in one variable	Hard

ID: ca8a54ef

How many solutions does the equation $12(x - 3) = -3(x + 12)$ have?

- A. Exactly one
- B. Exactly two
- C. Infinitely many
- D. Zero

ID: ca8a54ef Answer

Correct Answer: A

Rationale

Choice A is correct. Distributing **12** on the left-hand side and **−3** on the right-hand side of the given equation yields **$12x - 36 = -3x - 36$** . Adding **$3x$** to each side of this equation yields **$15x - 36 = -36$** . Adding **36** to each side of this equation yields **$15x = 0$** . Dividing each side of this equation by **15** yields **$x = 0$** . This means that **0** is the only solution to the given equation. Therefore, the given equation has exactly one solution.

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 bc52ce02

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Algebra	Linear equations in one variable	Hard

ID: bc52ce02

$$\frac{1}{4}(x + 5) - \frac{1}{3}(x + 5) = -7$$

What value of x is the solution to the given equation?

- A. -12
- B. -5
- C. **79**
- D. 204

ID: bc52ce02 Answer

Correct Answer: C

Rationale

Choice C is correct. For the given equation, $(x + 5)$ is a factor of both terms on the left-hand side. Therefore, the given equation can be rewritten as $(\frac{1}{4} - \frac{1}{3})(x + 5) = -7$, or $(\frac{3}{12} - \frac{4}{12})(x + 5) = -7$, which is equivalent to $-\frac{1}{12}(x + 5) = -7$. Multiplying both sides of this equation by -12 yields $x + 5 = 84$. Subtracting 5 from both sides of this equation yields $x = 79$.

Choice A is incorrect. This is the value of x for which the left-hand side of the given equation equals $\frac{7}{12}$, not -7 .

Choice B is incorrect. This is the value of x for which the left-hand side of the given equation equals 0 , not -7 .

Choice D is incorrect. This is the value of x for which the left-hand side of the given equation equals $-\frac{209}{12}$, not -7 .

Question Difficulty: Hard

Question ID 75e5fcb4

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Algebra	Linear equations in one variable	Hard

ID: 75e5fcb4

A company that creates and sells tape dispensers calculates its monthly profit, in dollars, by subtracting its fixed monthly costs, in dollars, from its monthly sales revenue, in dollars. The equation $15,000 = 2.00x - 4,500$ represents this situation for a month where x tape dispensers are created and sold. Which statement is the best interpretation of $2.00x$ in this context?

- A. The monthly sales revenue, in dollars, from selling x tape dispensers
- B. The monthly sales revenue, in dollars, from each tape dispenser sold
- C. The monthly cost, in dollars, of creating each tape dispenser
- D. The monthly cost, in dollars, of creating x tape dispensers

ID: 75e5fcb4 Answer

Correct Answer: A

Rationale

Choice A is correct. It's given that the equation $15,000 = 2.00x - 4,500$ represents this situation for a month where x tape dispensers are created and sold. It's also given that the company calculates its monthly profit, in dollars, by subtracting its fixed monthly costs, in dollars, from its monthly sales revenue, in dollars. It follows that $2.00x$ represents the monthly sales revenue, in dollars. Therefore, the best interpretation of $2.00x$ in this context is the monthly sales revenue from selling x tape dispensers.

Choice B is incorrect. This is the best interpretation of 2.00 , not $2.00x$.

Choice C is incorrect and may result from conceptual errors.

Choice D is incorrect. This is the best interpretation of $4,500$, not $2.00x$.

Question Difficulty: Hard

Question ID d8676331

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Algebra	Linear equations in one variable	Hard

ID: d8676331

A museum rents tablets to visitors. The museum earns revenue of **\$14** for each tablet rented for the day. On Wednesday, the museum earned **\$406** in profit from renting tablets after paying daily expenses of **\$112**. How many tablets did the museum rent on Wednesday? (**profit = total revenue – total expenses**)

ID: d8676331 Answer

Correct Answer: 37

Rationale

The correct answer is **37**. It's given that the museum earns revenue of **\$14** for each tablet rented for the day. It's also given that on Wednesday, the museum earned **\$406** in profit from renting tablets after paying daily expenses of **\$112**. Let x represent the number of tablets the museum rented on Wednesday. It follows that the total revenue can be represented by the expression $14x$. Because **profit = total revenue – total expenses**, the equation $406 = 14x - 112$ represents this situation. Adding **112** to both sides of this equation yields $14x = 518$. Dividing both sides of this equation by **14** yields $x = 37$. Therefore, the museum rented **37** tablets on Wednesday.

Question Difficulty: Hard

Question ID e64cc091

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Algebra	Linear equations in one variable	Hard

ID: e64cc091

If $\frac{6}{7}p + 18 = 54$, what is the value of $7p$?

ID: e64cc091 Answer

Correct Answer: 294

Rationale

The correct answer is **294**. Subtracting **18** from each side of the given equation yields $\frac{6}{7}p = 36$. Multiplying each side of this equation by $\frac{7}{6}$ yields $p = 42$. Multiplying each side of this equation by **7** yields $7p = 294$. Therefore, the value of $7p$ is **294**.

Question Difficulty: Hard

Question ID 888b76fd

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Algebra	Linear equations in one variable	Hard

ID: 888b76fd

If $9(4 - 3x) + 2 = 8(4 - 3x) + 18$, what is the value of $4 - 3x$?

- A. -16
- B. -4
- C. 4
- D. 16

ID: 888b76fd Answer

Correct Answer: D

Rationale

Choice D is correct. The value of $4 - 3x$ can be found by isolating this expression in the given equation. Subtracting 2 from both sides of the given equation yields $9(4 - 3x) = 8(4 - 3x) + 16$. Subtracting $8(4 - 3x)$ from both sides of this equation yields $9(4 - 3x) - 8(4 - 3x) = 16$, which gives $1(4 - 3x) = 16$, or $4 - 3x = 16$. Therefore, the value of $4 - 3x$ is 16 .

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

Choice B is incorrect. This is the value of x , not $4 - 3x$.

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

Question Difficulty: Hard

Question ID cac0cefd

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Algebra	Linear equations in one variable	Hard

ID: cac0cefd

A manufacturing plant makes 10-inch, 9-inch, and 7-inch frying pans. During a certain day, the number of 10-inch frying pans that the manufacturing plant makes is 4 times the number n of 9-inch frying pans it makes, and the number of 7-inch frying pans it makes is 10. During this day, the manufacturing plant makes 100 frying pans total. Which equation represents this situation?

- A. $10(4n) + 9n + 7(10) = 100$
- B. $10n + 9n + 7n = 100$
- C. $4n + 10 = 100$
- D. $5n + 10 = 100$

ID: cac0cefd Answer

Correct Answer: D

Rationale

Choice D is correct. It's given that during a certain day, the number of 9-inch frying pans the manufacturing plant makes is n and the number of 7-inch frying pans it makes is 10. It's also given that during this day the number of 10-inch frying pans that the manufacturing plant makes is 4 times the number of 9-inch frying pans, or $4n$. Therefore, the total number of 7-inch, 9-inch, and 10-inch frying pans the manufacturing plant makes is $n + 10 + 4n$, or $5n + 10$. It's given that during this day the manufacturing plant makes 100 frying pans total. Thus, the equation $5n + 10 = 100$ represents this situation.

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 a45f311e

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Algebra	Linear equations in one variable	Hard

ID: a45f311e

Each side of a **30**-sided polygon has one of three lengths. The number of sides with length **8 centimeters (cm)** is **5** times the number of sides n with length **3 cm**. There are **6** sides with length **4 cm**. Which equation must be true for the value of n ?

- A. $5n + 6 = 30$
- B. $6n + 6 = 30$
- C. $8n + 3n + 4n = 30$
- D. $8(5n) + 3n + 4(6) = 30$

ID: a45f311e Answer

Correct Answer: B

Rationale

Choice B is correct. It's given that each side of a **30**-sided polygon has one of three lengths. It's also given that the number of sides with length **8 centimeters (cm)** is **5** times the number of sides n with length **3 cm**. Therefore, there are $5 \times n$, or $5n$, sides with length **8 cm**. It's also given that there are **6** sides with length **4 cm**. Therefore, the number of **3 cm**, **4 cm**, and **8 cm** sides are n , **6**, and $5n$, respectively. Since there are a total of **30** sides, the equation $n + 6 + 5n = 30$ represents this situation. Combining like terms on the left-hand side of this equation yields $6n + 6 = 30$. Therefore, the equation that must be true for the value of n is $6n + 6 = 30$.

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

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

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

Question Difficulty: Hard