

Question ID 73f17756

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Problem-Solving and Data Analysis	Ratios, rates, proportional relationships, and units	Medium

ID: 73f17756

How many yards are equivalent to **77** rods? (**5.5 yards = 1 rod**)

ID: 73f17756 Answer

Correct Answer: 423.5, 847/2

Rationale

The correct answer is **423.5**. It's given that **5.5 yards = 1 rod**. Therefore, **77** rods is equivalent to **(77 rods) $\left(\frac{5.5 \text{ yards}}{1 \text{ rod}}\right)$** , or **423.5** yards. Note that 423.5 and 847/2 are examples of ways to enter a correct answer.

Question Difficulty: Medium

Question ID 3fbb76c7

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Problem-Solving and Data Analysis	Ratios, rates, proportional relationships, and units	Medium

ID: 3fbb76c7

The ratio of the length of line segment XY to the length of line segment ZV is **6** to **1**. If the length of line segment XY is **102** inches, what is the length, in inches, of line segment ZV ?

- A. **17**
- B. **96**
- C. **102**
- D. **612**

ID: 3fbb76c7 Answer

Correct Answer: A

Rationale

Choice A is correct. It's given that the ratio of the length of line segment XY to the length of line segment ZV is **6** to **1**, which means $\frac{XY}{ZV} = \frac{6}{1}$. It's given that the length of line segment XY is **102** inches. If the length, in inches, of line segment ZV is represented by ℓ , the value of ℓ can be calculated by solving the equation $\frac{102}{\ell} = \frac{6}{1}$, or $\frac{102}{\ell} = 6$. Multiplying each side of this equation by ℓ yields $102 = 6\ell$. Dividing each side of this equation by **6** yields $17 = \ell$. Therefore, the length of line segment ZV is **17** inches.

Choice B is incorrect. This is the length, in inches, of line segment ZV if the length of line segment XY is **576**, not **102**, inches.

Choice C is incorrect. This is the length, in inches, of line segment XY , not line segment ZV .

Choice D is incorrect. This is the length, in inches, of line segment ZV if the ratio of the length of line segment XY to the length of line segment ZV is **1** to **6**, not **6** to **1**.

Question Difficulty: Medium

Question ID 4bf5a03e

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Problem-Solving and Data Analysis	Ratios, rates, proportional relationships, and units	Medium

ID: 4bf5a03e

A fish swam a distance of **5,104** yards. How far did the fish swim, in miles? (**1 mile = 1,760 yards**)

- A. **0.3**
- B. **2.9**
- C. **3,344**
- D. **6,864**

ID: 4bf5a03e Answer

Correct Answer: B

Rationale

Choice B is correct. It’s given that the fish swam **5,104** yards and that **1** mile is equal to **1,760** yards. Therefore, the fish swam **5,104 yards** $\left(\frac{1 \text{ mile}}{1,760 \text{ yards}}\right)$, which is equivalent to $\frac{5,104}{1,760}$ **miles**, or **2.9** miles.

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: Medium

Question ID be37047b

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Problem-Solving and Data Analysis	Ratios, rates, proportional relationships, and units	Medium

ID: be37047b

A giant armadillo has a mass of **39** kilograms. What is the giant armadillo's mass in **grams**?
(**1 kilogram = 1,000 grams**)

ID: be37047b Answer

Correct Answer: 39000

Rationale

The correct answer is **39,000**. It's given that the giant armadillo has a mass of **39** kilograms. Since **1** kilogram is equal to **1,000** grams, **39** kilograms is equal to **39 kilograms** $\left(\frac{1,000 \text{ grams}}{1 \text{ kilogram}}\right)$, or **39,000** grams. Therefore, the giant armadillo's mass, in grams, is **39,000**.

Question Difficulty: Medium

Question ID 72de59a3

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Problem-Solving and Data Analysis	Ratios, rates, proportional relationships, and units	Medium

ID: 72de59a3

A special camera is used for underwater ocean research. When the camera is at a depth of **58** fathoms, what is the camera's depth in feet? (**1 fathom = 6 feet**)

ID: 72de59a3 Answer

Correct Answer: 348

Rationale

The correct answer is **348**. It's given that **1** fathom is equivalent to **6** feet. Therefore, **58** fathoms is equivalent to **(58 fathoms)** $\left(\frac{6 \text{ feet}}{1 \text{ fathom}}\right)$, or **348** feet. Thus, when the camera is at a depth of **58** fathoms, the camera's depth, in feet, is **348**.

Question Difficulty: Medium

Question ID 4b772c54

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Problem-Solving and Data Analysis	Ratios, rates, proportional relationships, and units	Medium

ID: 4b772c54

An object travels at a constant speed of **6** centimeters per second. At this speed, what is the time, in seconds, that it would take for the object to travel **24** centimeters?

ID: 4b772c54 Answer

Correct Answer: 4

Rationale

The correct answer is **4**. It's given that the object travels at a constant speed of **6** centimeters per second. The speed of the object can be written as $\frac{6 \text{ centimeters}}{1 \text{ second}}$. Let x represent the time, in seconds, it would take for the object to travel **24** centimeters. The value of x can be calculated by solving the equation $\frac{6 \text{ centimeters}}{1 \text{ second}} = \frac{24 \text{ centimeters}}{x \text{ seconds}}$, which can be written as $\frac{6}{1} = \frac{24}{x}$, or $6 = \frac{24}{x}$. Multiplying each side of this equation by x yields $6x = 24$. Dividing each side of this equation by **6** yields $x = 4$. Therefore, it would take the object **4** seconds to travel **24** centimeters.

Question Difficulty: Medium

Question ID 0ce6ee92

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Problem-Solving and Data Analysis	Ratios, rates, proportional relationships, and units	Medium

ID: 0ce6ee92

The ratio x to y is equivalent to the ratio 12 to t . When $x = 156$, what is the value of y in terms of t ?

- A. $13t$
- B. $12t$
- C. ~~$14t$~~
- D. $168t$

ID: 0ce6ee92 Answer

Correct Answer: A

Rationale

Choice A is correct. It's given that the ratio x to y is equivalent to the ratio 12 to t . This can be represented by $\frac{x}{y} = \frac{12}{t}$. Substituting 156 for x in this equation yields $\frac{156}{y} = \frac{12}{t}$. This can be rewritten as $12y = 156t$. Dividing both sides of this equation by 12 yields $y = 13t$. Therefore, when $x = 156$, the value of y in terms of t is $13t$.

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: Medium

Question ID c4714d19

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Problem-Solving and Data Analysis	Ratios, rates, proportional relationships, and units	Medium

ID: c4714d19

A cherry pitting machine pits **12** pounds of cherries in **3** minutes. At this rate, how many minutes does it take the machine to pit **96** pounds of cherries?

- A. 8
- B. 15
- C. 24
- D. 36

ID: c4714d19 Answer

Correct Answer: C

Rationale

Choice C is correct. It's given that the cherry pitting machine pits **12** pounds of cherries in **3** minutes. This rate can be written as $\frac{12 \text{ pounds of cherries}}{3 \text{ minutes}}$. If the number of minutes it takes the machine to pit **96** pounds of cherries is represented by x , the value of x can be calculated by solving the equation $\frac{12 \text{ pounds of cherries}}{3 \text{ minutes}} = \frac{96 \text{ pounds of cherries}}{x \text{ minutes}}$, which can be rewritten as $\frac{12}{3} = \frac{96}{x}$, or $4 = \frac{96}{x}$. Multiplying each side of this equation by x yields $4x = 96$. Dividing each side of this equation by **4** yields $x = 24$. Therefore, it takes the machine **24** minutes to pit **96** pounds of cherries.

Choice A is incorrect. This is the number of minutes it takes the machine to pit **32**, not **96**, pounds of cherries.

Choice B is incorrect. This is the number of minutes it takes the machine to pit **60**, not **96**, pounds of cherries.

Choice D is incorrect. This is the number of minutes it takes the machine to pit **144**, not **96**, pounds of cherries.

Question Difficulty: Medium

Question ID bf46227e

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Problem-Solving and Data Analysis	Ratios, rates, proportional relationships, and units	Medium

ID: bf46227e

How many feet are equivalent to **34** yards? (**1 yard = 3 feet**)

ID: bf46227e Answer

Correct Answer: 102

Rationale

The correct answer is **102**. It’s given that **1** yard is equivalent to **3** feet. Therefore, **34** yards is equivalent to **(34 yards)** $\left(\frac{3\text{ feet}}{1\text{ yard}}\right)$, or **102** feet.

Question Difficulty: Medium

Question ID eab1acc0

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Problem-Solving and Data Analysis	Ratios, rates, proportional relationships, and units	Medium

ID: eab1acc0

The number of raccoons in a **131**-square-mile area is estimated to be **2,358**. What is the estimated population density, in raccoons per square mile, of this area?

- A. 18
- B. 131
- C. 149
- D. 2,376

ID: eab1acc0 Answer

Correct Answer: A

Rationale

Choice A is correct. It’s given that there are **2,358** raccoons in a **131**-square-mile area. The estimated population density, in raccoons per square mile, is the estimated number of raccoons divided by the number of square miles. Therefore, the estimated population density of this area is $\frac{2,358 \text{ raccoons}}{131 \text{ square miles}}$, or **18** raccoons per square mile.

Choice B is incorrect. This is the number of square miles in the area, not the estimated number of raccoons per square mile in this area.

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: Medium

Question ID 28abaf2d

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Problem-Solving and Data Analysis	Ratios, rates, proportional relationships, and units	Medium

ID: 28abaf2d

A participant in a bicycle race completes the race with an average speed of **24,816** yards per hour. What is this average speed, in miles per hour? (**1 mile = 1,760 yards**)

ID: 28abaf2d Answer

Correct Answer: 14.1

Rationale

The correct answer is **14.1**. It's given that a participant completes the bicycle race with an average speed of **24,816** yards per hour and **1 mile = 1,760 yards**. It follows that this average speed is equivalent to $\left(\frac{24,816 \text{ yards}}{1 \text{ hour}}\right)\left(\frac{1 \text{ mile}}{1,760 \text{ yards}}\right)$, which yields $\frac{14.1 \text{ miles}}{1 \text{ hour}}$, or **14.1** miles per hour.

Question Difficulty: Medium

Question ID 42d0621f

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Problem-Solving and Data Analysis	Ratios, rates, proportional relationships, and units	Medium

ID: 42d0621f

A special camera is used for underwater ocean research. The camera is at a depth of **39** fathoms. What is the camera's depth in feet? (**1 fathom = 6 feet**)

- A. **234**
- B. **117**
- C. **45**
- D. **7**

ID: 42d0621f Answer

Correct Answer: A

Rationale

Choice A is correct. It’s given that a special camera is used for underwater ocean research, and this camera is at a depth of **39** fathoms. It's also given that **1** fathom is equal to **6** feet. Thus, **39** fathoms is equivalent to **(39 fathoms) $(\frac{6 \text{ feet}}{1 \text{ fathom}})$** , or **234** feet. Therefore, the camera's depth, in feet, is **234**.

Choice B is incorrect. This is the camera's depth, in feet, if the camera is at a depth of **19.5** fathoms.

Choice C is incorrect. This is the camera's depth, in feet, if the camera is at a depth of **7.5** fathoms.

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

Question Difficulty: Medium

Question ID e0ec5e9b

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Problem-Solving and Data Analysis	Ratios, rates, proportional relationships, and units	Medium

ID: e0ec5e9b

A certain bird species can fly at an average speed of **16** meters per second when in continuous flight. At this rate, how many meters would this bird species fly in **4** seconds?

- A. **64**
- B. **20**
- C. **16**
- D. **12**

ID: e0ec5e9b Answer

Correct Answer: A

Rationale

Choice A is correct. It's given that a certain bird species can fly at an average speed of **16** meters per second when in continuous flight. At this rate, in **4** seconds this bird species would fly $(\frac{16 \text{ meters}}{\text{second}})(4 \text{ seconds})$, or **64** meters.

Choice B is incorrect. This is the value of **16 + 4**, not **16(4)**.

Choice C is incorrect. This is the distance the bird would fly in **1** second, not **4** seconds.

Choice D is incorrect. This is the value of **16 – 4**, not **16(4)**.

Question Difficulty: Medium

Question ID 0147070d

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Problem-Solving and Data Analysis	Ratios, rates, proportional relationships, and units	Medium

ID: 0147070d

A printer produces posters at a constant rate of **42** posters per minute. At what rate, in posters per hour, does the printer produce the posters?

ID: 0147070d Answer

Correct Answer: 2520

Rationale

The correct answer is **2,520**. There are **60** minutes in one hour. At a rate of **42** posters per minute, the number of posters produced in one hour can be determined by $\left(\frac{42 \text{ posters}}{1 \text{ minute}}\right)\left(\frac{60 \text{ minutes}}{1 \text{ hour}}\right)$, which is **2,520** posters per hour.

Question Difficulty: Medium

Question ID 261eeb93

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Problem-Solving and Data Analysis	Ratios, rates, proportional relationships, and units	Medium

ID: 261eeb93

Tilly earns p dollars for every w hours of work. Which expression represents the amount of money, in dollars, Tilly earns for $39w$ hours of work?

- A. $39p$
- B. $\frac{p}{39}$
- C. $p + 39$
- D. $p - 39$

ID: 261eeb93 Answer

Correct Answer: A

Rationale

Choice A is correct. It's given that Tilly earns p dollars for every w hours of work. This can be represented by the proportion $\frac{p}{w}$. The amount of money, x , Tilly earns for $39w$ hours of work can be found by setting up the proportion $\frac{p}{w} = \frac{x}{39w}$. This can be rewritten as $39pw = xw$. Dividing both sides by w results in $x = 39p$.

Choice B is incorrect. This is the amount of money Tilly earns in dollars per hour, not the amount of money Tilly earns for $39w$ hours of work.

Choice C is incorrect. This is the amount of money Tilly earns for w hours of work plus 39 , not the amount of money Tilly earns for $39w$ hours of work.

Choice D is incorrect. This is the amount of money Tilly earns for w hours of work minus 39 , not the amount of money Tilly earns for $39w$ hours of work.

Question Difficulty: Medium

Question ID c2ac2720

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Problem-Solving and Data Analysis	Ratios, rates, proportional relationships, and units	Medium

ID: c2ac2720

An object travels at a constant speed of **12** centimeters per second. At this speed, what is the time, in seconds, that it would take for the object to travel **108** centimeters?

- A. **9**
- B. **96**
- C. **120**
- D. **972**

ID: c2ac2720 Answer

Correct Answer: A

Rationale

Choice A is correct. If the object travels **108** centimeters at a speed of **12** centimeters per second, the time of travel can be determined by dividing the total distance by the speed. This results in $\frac{108 \text{ centimeters}}{12 \text{ centimeters/second}}$, which is **9** seconds.

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: Medium