

Question ID 1c92f5b3

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Problem-Solving and Data Analysis	Ratios, rates, proportional relationships, and units	<div><div></div><div></div><div></div></div>

ID: 1c92f5b3

An insect moves at a speed of $\frac{3}{20}$ feet per second. What is this speed, in yards per second? (**3 feet = 1 yard**)

- A. $\frac{1}{20}$
- B. $\frac{9}{20}$
- C. 6
- D. 20

ID: 1c92f5b3 Answer

Correct Answer: A

Rationale

Choice A is correct. It’s given that 3 feet = 1 yard. It follows that a speed of $\frac{3}{20}$ feet per second is equivalent to $\frac{\frac{3}{20} \text{ feet}}{1 \text{ second}} \cdot \frac{1 \text{ yard}}{3 \text{ feet}}$, which is equivalent to $\frac{3}{20} \cdot \frac{1}{3}$, or $\frac{1}{20}$, yards per second.

Choice B is incorrect. This is the speed, in feet per second, that's equivalent to $\frac{3}{20}$ yards per second.

Choice C is incorrect. This is the speed, in yards per second, that's equivalent to 18, not $\frac{3}{20}$, feet per second.

Choice D is incorrect. This is the speed, in yards per second, that's equivalent to 60, not $\frac{3}{20}$, feet per second.

Question Difficulty: Medium

Question ID 354dd385

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Problem-Solving and Data Analysis	Ratios, rates, proportional relationships, and units	<div><div></div><div></div><div></div></div>

ID: 354dd385

A competition consisted of four different events. One participant completed the first event with an average speed of **20.300** miles per hour. What was this average speed, in yards per hour? (**1 mile = 1,760 yards**)

ID: 354dd385 Answer

Correct Answer: 35728

Rationale

The correct answer is 35,728. It's given that 1 mile = 1,760 yards. It follows that an average speed of 20.300 miles per hour is equivalent to $\frac{20.300 \text{ miles}}{1 \text{ hour}} \cdot \frac{1,760 \text{ yards}}{1 \text{ mile}}$, or 35,728 yards per hour.

Question Difficulty: Medium

Question ID b0f7f399

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Problem-Solving and Data Analysis	Ratios, rates, proportional relationships, and units	<div><div></div><div></div><div></div></div>

ID: b0f7f399

A triathlon is a multisport race consisting of three different legs. A triathlon participant completed the cycling leg with an average speed of **19.700** miles per hour. What was the average speed, in yards per hour, of the participant during the cycling leg? (**1 mile = 1,760 yards**)

ID: b0f7f399 Answer

Correct Answer: 34672

Rationale

The correct answer is 34,672. It's given that 1 mile = 1,760 yards. It follows that an average speed of 19.700 miles per hour is equivalent to $\frac{19.700 \text{ miles}}{1 \text{ hour}} \frac{1,760 \text{ yards}}{1 \text{ mile}}$, or 34,672 yards per hour.

Question Difficulty: Medium

Question ID 988ab336

Assessment	Test	Domain	Skill	Difficulty
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ID: 988ab336

The population density of Cedar County is **230** people per square mile. The county has a population of **85,100** people. What is the area, in square miles, of Cedar County?

ID: 988ab336 Answer

Correct Answer: 370

Rationale

The correct answer is 370. It’s given that the population density of Cedar County is 230 people per square mile and the county has a population of 85,100 people. Based on the population density, it follows that the area of Cedar County is $85,100 \text{ people} \times \frac{1 \text{ square mile}}{230 \text{ people}}$, or 370 square miles.

Question Difficulty: Medium

Question ID 10ff87f3

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Problem-Solving and Data Analysis	Ratios, rates, proportional relationships, and units	<div><div></div><div></div><div></div></div>

ID: 10ff87f3

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

ID: 10ff87f3 Answer

Correct Answer: 423.5, 847/2

Rationale

The correct answer is 423.5. It's given that $5.5 \text{ yards} = 1 \text{ rod}$. Therefore, 77 rods is equivalent to $77 \text{ rods} \frac{5.5 \text{ yards}}{1 \text{ rod}}$, 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 74a66620

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Problem-Solving and Data Analysis	Ratios, rates, proportional relationships, and units	<div><div></div><div></div><div></div></div>

ID: 74a66620

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: 74a66620 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 $\frac{102}{l} = \frac{6}{1}$, or $\frac{102}{l} = 6$. Multiplying each side of this equation by l yields $102 = 6l$. Dividing each side of this equation by 6 yields $17 = l$. 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 a5bc3f67

Assessment	Test	Domain	Skill	Difficulty
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ID: a5bc3f67

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: a5bc3f67 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 $\frac{24,816 \text{ yards}}{1 \text{ hour}} \frac{1 \text{ mile}}{1,760 \text{ yards}}$, which yields $\frac{14.1 \text{ miles}}{1 \text{ hour}}$, or 14.1 miles per hour.

Question Difficulty: Medium

Question ID 738856d4

Assessment	Test	Domain	Skill	Difficulty
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ID: 738856d4

How many fluid ounces are equivalent to **76** quarts? (**8 fluid ounces = 1 cup** and **4 cups = 1 quart**)

ID: 738856d4 Answer

Correct Answer: 2432

Rationale

The correct answer is 2,432. It's given that 4 cups = 1 quart. It follows that 76 quarts is equivalent to $76 \text{ quarts} \frac{4 \text{ cups}}{1 \text{ quart}}$, or 304 cups. It's also given that 8 fluid ounces = 1 cup. It follows that 304 cups is equivalent to $304 \text{ cups} \frac{8 \text{ fluid ounces}}{1 \text{ cup}}$, or 2,432 fluid ounces.

Question Difficulty: Medium

Question ID b85e0fb8

Assessment	Test	Domain	Skill	Difficulty
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ID: b85e0fb8

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. $144t$
- D. $168t$

ID: b85e0fb8 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 35fb60c1

Assessment	Test	Domain	Skill	Difficulty
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ID: 35fb60c1

The ratio **140** to *m* is equivalent to the ratio **4** to **28**. What is the value of *m*?

ID: 35fb60c1 Answer

Correct Answer: 980

Rationale

The correct answer is 980. It's given that the ratio 140 to *m* is equivalent to the ratio 4 to 28. Therefore, the value of *m* can be found by solving the equation $\frac{140}{m} = \frac{4}{28}$. Multiplying each side of this equation by *m* yields $140 = \frac{4m}{28}$. Multiplying each side of this equation by 28 yields $3,920 = 4m$. Dividing each side of this equation by 4 yields $980 = m$. Therefore, the value of *m* is 980.

Question Difficulty: Medium

Question ID f0ca5e13

Assessment	Test	Domain	Skill	Difficulty
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ID: f0ca5e13

A distance of **61** furlongs is equivalent to how many feet? (**1 furlong = 220 yards and 1 yard = 3 feet**)

ID: f0ca5e13 Answer

Correct Answer: 40260

Rationale

The correct answer is 40,260. It's given that 1 furlong = 220 yards and 1 yard = 3 feet. It follows that a distance of 61 furlongs is equivalent to $61 \text{ furlongs} \times \frac{220 \text{ yards}}{1 \text{ furlong}} \times \frac{3 \text{ feet}}{1 \text{ yard}}$, or 40,260 feet.

Question Difficulty: Medium

Question ID 7af63c22

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Problem-Solving and Data Analysis	Ratios, rates, proportional relationships, and units	<div><div></div><div></div><div></div></div>

ID: 7af63c22

An object has a mass of **168** grams and a volume of **24** cubic centimeters. What is the density, in grams per cubic centimeter, of the object?

- A. **7**
- B. **144**
- C. **192**
- D. **4,032**

ID: 7af63c22 Answer

Correct Answer: A

Rationale

Choice A is correct. It's given that the object has a mass of 168 grams and a volume of 24 cubic centimeters. Dividing the mass, in grams, of the object by the volume, in cubic centimeters, of the object gives the density, in grams per cubic centimeter, of the object. It follows that the density of the object is $\frac{168 \text{ grams}}{24 \text{ cubic centimeters}}$, which is equivalent to $\frac{168}{24}$ grams per cubic centimeter, or 7 grams per cubic centimeter.

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 c963a231

Assessment	Test	Domain	Skill	Difficulty
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ID: c963a231

A distance of **112** furlongs is equivalent to how many feet? (**1 furlong = 220 yards and 1 yard = 3 feet**)

ID: c963a231 Answer

Correct Answer: 73920

Rationale

The correct answer is 73,920. It's given that $1 \text{ furlong} = 220 \text{ yards}$ and $1 \text{ yard} = 3 \text{ feet}$. It follows that a distance of 112 furlongs is equivalent to $112 \text{ furlongs} \times \frac{220 \text{ yards}}{1 \text{ furlong}} \times \frac{3 \text{ feet}}{1 \text{ yard}}$, or 73,920 feet.

Question Difficulty: Medium