

HOSA Medical Math Assessment Practice Test (Sample)

Study Guide



Everything you need from our exam experts!

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SAMPLE

Questions

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- 1. What is the formula to convert Fahrenheit to Celsius?**
 - A. $C = (F - 32) \times 5/9$**
 - B. $C = (F + 32) \times 5/9$**
 - C. $C = (F - 32) \times 9/5$**
 - D. $C = (F + 32) \times 9/5$**
- 2. What is the purpose of measuring variance in statistics?**
 - A. To identify the average of a dataset**
 - B. To assess the degree of spread in individual data points from the mean**
 - C. To determine the trend of a dataset**
 - D. To calculate the total sum of variables**
- 3. How many liters are in 500 mL?**
 - A. 0.25 L**
 - B. 0.5 L**
 - C. 1.0 L**
 - D. 1.5 L**
- 4. If a prescription requires 450 mL over 6 hours, how many mL per hour should the patient receive?**
 - A. 50 mL/hour**
 - B. 75 mL/hour**
 - C. 100 mL/hour**
 - D. 25 mL/hour**
- 5. If a 500 mg tablet is split into thirds, how much medication is in each piece?**
 - A. 200 mg**
 - B. 166.67 mg**
 - C. 150 mg**
 - D. 175 mg**

- 6. How many cups are in 1 pint?**
- A. 2 cups**
 - B. 4 cups**
 - C. 6 cups**
 - D. 8 cups**
- 7. If a solution contains 5 grams of solute in 250 mL of solvent, what is the molarity (M) if the molar mass of solute is 50 g/mol?**
- A. 0.4 M**
 - B. 0.2 M**
 - C. 0.5 M**
 - D. 0.8 M**
- 8. How many milliliters are equivalent to 0.067 liters?**
- A. 66.7 mL**
 - B. 7.67 mL**
 - C. 670 mL**
 - D. 67 mL**
- 9. How many feet are in 0.914 meters?**
- A. 2 feet**
 - B. 3 feet**
 - C. 4 feet**
 - D. 5 feet**
- 10. How do you find the total amount of variables in a dataset?**
- A. Add all the values together**
 - B. Count the number of data points**
 - C. Subtract the highest from the lowest**
 - D. Multiply all values together**

Answers

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1. A
2. B
3. B
4. B
5. B
6. A
7. A
8. D
9. B
10. B

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Explanations

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1. What is the formula to convert Fahrenheit to Celsius?

A. $C = (F - 32) \times 5/9$

B. $C = (F + 32) \times 5/9$

C. $C = (F - 32) \times 9/5$

D. $C = (F + 32) \times 9/5$

The formula to convert Fahrenheit to Celsius is correctly identified as $C = (F - 32) \times 5/9$. This formula reflects the relationship between the two temperature scales. When converting temperature from Fahrenheit (F) to Celsius (C), the first step is to subtract 32 from the Fahrenheit temperature. This adjustment accounts for the fact that the zero points of the two scales differ significantly; for example, 32°F is the freezing point of water, while 0°C is the same point on the Celsius scale. Next, multiplying by 5/9 scales the result appropriately, aligning it with the Celsius value. The factor of 5/9 is derived from the ratio of the intervals or degrees between the two scales: there are 180 degrees between the freezing and boiling points in Fahrenheit compared to 100 degrees in Celsius. Using the other formulas would lead to incorrect conversions. For instance, adding or incorrectly using the fractions with 9 in the numerator would not yield a correct Celsius temperature, since these adjustments do not align with the actual temperature interval conversions between the two scales.

2. What is the purpose of measuring variance in statistics?

A. To identify the average of a dataset

B. To assess the degree of spread in individual data points from the mean

C. To determine the trend of a dataset

D. To calculate the total sum of variables

The purpose of measuring variance in statistics is to assess the degree of spread in individual data points from the mean. Variance quantifies how far each data point in the set deviates from the mean, providing insight into the distribution and variability within the dataset. A higher variance indicates a wider spread of values, while a lower variance suggests that the data points are closer to the mean. Understanding this spread is crucial for interpreting data, making predictions, and performing further statistical analyses. Some options, while related to statistics, do not capture the specific role of variance. For instance, identifying the average of a dataset pertains to calculating the mean, which does not reflect variability. Determining the trend of a dataset relates more to analyzing its direction or movement over time rather than its spread around the mean. Similarly, calculating the total sum of variables focuses on aggregating values rather than evaluating their dispersion. Thus, the focus on assessing the spread from the mean makes the selected answer accurate and relevant in the context of statistics.

3. How many liters are in 500 mL?

- A. 0.25 L
- B. 0.5 L**
- C. 1.0 L
- D. 1.5 L

To determine how many liters are in 500 mL, it is important to understand the metric conversion between milliliters and liters. One liter is equivalent to 1,000 milliliters. Therefore, to convert milliliters to liters, one can divide the number of milliliters by 1,000. In this case, you take 500 mL and divide it by 1,000: $500 \text{ mL} \div 1,000 = 0.5 \text{ L}$. The result shows that 500 mL is equal to 0.5 liters. This conversion is straightforward, as it directly applies the relationship between the two units of measurement. Consequently, the correct answer of 0.5 L accurately represents the conversion from 500 mL to liters.

4. If a prescription requires 450 mL over 6 hours, how many mL per hour should the patient receive?

- A. 50 mL/hour
- B. 75 mL/hour**
- C. 100 mL/hour
- D. 25 mL/hour

To determine the mL per hour that the patient should receive, you can start by dividing the total volume prescribed by the total time in hours. In this case, the prescription indicates that the patient needs 450 mL of fluid over a period of 6 hours. Therefore, the calculation to find the mL per hour is: $450 \text{ mL} \div 6 \text{ hours} = 75 \text{ mL/hour}$. This means the patient should receive 75 mL for each hour of the 6-hour duration. The choice indicating 75 mL/hour accurately reflects the required rate of administration, providing a clear understanding of the medication's delivery over the specified time.

5. If a 500 mg tablet is split into thirds, how much medication is in each piece?

- A. 200 mg
- B. 166.67 mg**
- C. 150 mg
- D. 175 mg

To determine the amount of medication in each piece when a 500 mg tablet is split into thirds, you start by dividing the total amount of medication by the number of pieces. In this case, you take the 500 mg and divide it by 3, as the tablet is split into three equal parts. When you perform this calculation: $500 \text{ mg} \div 3 = 166.67 \text{ mg}$. This result indicates that each piece contains approximately 166.67 mg of medication. This is pertinent in medical settings because accurate dosing is crucial for patient safety and effective treatment. Knowing how to calculate portions of medication accurately ensures that patients receive the appropriate amount of medication, especially in cases where full tablets cannot be swallowed or where precise dosing is required for efficacy and safety.

6. How many cups are in 1 pint?

A. 2 cups

B. 4 cups

C. 6 cups

D. 8 cups

One pint is equivalent to 2 cups. This conversion is based on the standard measurement used in cooking and nutrition, where 1 pint equals 16 fluid ounces. Since 1 cup is equal to 8 fluid ounces, you can determine the number of cups in a pint by dividing the total number of ounces in a pint by the number of ounces in a cup. In this case: 16 fluid ounces in a pint ÷ 8 fluid ounces in a cup = 2 cups. This is a widely accepted conversion, making it crucial for anyone involved in cooking, baking, or nutrition to understand and apply.

7. If a solution contains 5 grams of solute in 250 mL of solvent, what is the molarity (M) if the molar mass of solute is 50 g/mol?

A. 0.4 M

B. 0.2 M

C. 0.5 M

D. 0.8 M

To determine the molarity of a solution, you need to use the formula for molarity, which is the number of moles of solute divided by the volume of solution in liters. First, it is necessary to calculate the number of moles of the solute present in the solution. Given that the mass of the solute is 5 grams and the molar mass is 50 g/mol, the number of moles can be calculated as follows:
$$\text{Moles} = \frac{\text{mass (g)}}{\text{molar mass (g/mol)}} = \frac{5 \text{ g}}{50 \text{ g/mol}} = 0.1 \text{ moles}$$
 Next, convert the volume of the solvent from milliliters to liters. Since there are 1000 mL in 1 L, we have:
$$250 \text{ mL} = 0.250 \text{ L}$$
 Now that we have both the number of moles and the volume in liters, we can calculate the molarity:
$$M = \frac{\text{moles of solute}}{\text{volume of solution in liters}}$$

8. How many milliliters are equivalent to 0.067 liters?

A. 66.7 mL

B. 7.67 mL

C. 670 mL

D. 67 mL

To convert liters to milliliters, it's important to remember the relationship between these two metric units: 1 liter is equal to 1,000 milliliters. To find out how many milliliters are in 0.067 liters, you can use the conversion factor. Multiply the number of liters by 1,000 to convert it to milliliters:
$$0.067 \text{ liters} \times 1,000 = 67 \text{ milliliters}$$
 Therefore, the answer of 67 milliliters accurately represents the equivalent volume in milliliters for 0.067 liters. Understanding this conversion is essential in medical settings, as accurate dosing and administration of liquid medications often require precise measurements in milliliters.

9. How many feet are in 0.914 meters?

- A. 2 feet
- B. 3 feet**
- C. 4 feet
- D. 5 feet

To convert meters to feet, it is important to use the correct conversion factor. The relationship between meters and feet is that one meter is approximately equal to 3.28084 feet. To find the number of feet in 0.914 meters, you multiply 0.914 by the conversion factor of 3.28084. So, the calculation is: $0.914 \text{ meters} \times 3.28084 \text{ feet/meter} =$ approximately 3 feet. This calculation shows that 0.914 meters is closest to 3 feet, making this the correct choice. Understanding this conversion helps in fields such as healthcare, where precise measurements are often necessary for medication dosages or medical device setups.

10. How do you find the total amount of variables in a dataset?

- A. Add all the values together
- B. Count the number of data points**
- C. Subtract the highest from the lowest
- D. Multiply all values together

To determine the total amount of variables in a dataset, it is essential to count the number of distinct data points or entries. Each data point represents a specific variable and contributes to the overall dataset size. This approach gives a clear view of the extent of the dataset, allowing for accurate analysis and interpretation. When seeking to understand the composition of a dataset, simply summing up values or performing operations like subtraction or multiplication does not provide information about the number of entries or variables present. Focusing on counting data points, however, directly informs you how many variables exist, making it the most effective method for this purpose.