HESI Math Practice Exam (Sample)

Study Guide

BY EXAMZIFY

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Questions

1. What is the cube root of 27?

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

2. What defines a 'proportion' in mathematics?

- A. Two different numbers
- B. Two ratios that have equal values
- C. A single fraction
- D. A ratio expressed as a percentage

3. Which of the following statements is true regarding numbers to the right of the decimal point?

- A. They are whole numbers
- B. They have different terminology than whole numbers
- C. They are always ignored in calculations
- D. They cannot be less than ten

4. What does the "HESI Hint" suggest is important for keeping problems aligned?

- A. Using a calculator
- B. Applying placeholders
- C. Writing in pencil
- D. Checking work carefully

5. How many milliliters are equivalent to 1 liter?

- A. 500
- B. 1,000
- C. 2,000
- D. 2,500

6. What is the equation to find out what percent a fraction exceeds another fraction?

- **A. (New fraction - Original fraction) / New fraction**
- **B. (New fraction - Original fraction) / Original fraction × 100%**
- **C. (Original fraction - New fraction) / New fraction**
- **D. (New fraction + Original fraction) / Original fraction**

7. What is the term for the number that divides the dividend in a division problem?

- **A. Dividend**
- **B. Divisor**
- **C. Quotient**
- **D. Remainder**

8. What is the mean of the following numbers: 4, 8, 6, 5, 7?

- **A. 5**
- **B. 6**
- **C. 7**
- **D. 8**

9. What is 95% of 20?

- **A. 15**
- **B. 18**
- **C. 19**
- **D. 20**

10. How many meters are in a kilometer?

- **A. 100**
- **B. 500**
- **C. 1,000**
- **D. 1,500**

Answers

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

Explanations

1. What is the cube root of 27?

A. 2

B. 3

C. 4

D. 5

The cube root of a number is a value that, when multiplied by itself three times, gives the original number. In this case, we're looking for the cube root of 27. To find the cube root of 27, we can look for a number that, when raised to the power of three, equals 27. By testing small whole numbers, we see that 3 multiplied by itself three times gives us: 3 × 3 × 3 = 27. This shows that the cube root of 27 is indeed 3. Therefore, the answer is correct because 3 is the only number that meets the requirement of being multiplied by itself three times to yield 27.

2. What defines a 'proportion' in mathematics?

A. Two different numbers

B. Two ratios that have equal values

C. A single fraction

D. A ratio expressed as a percentage

A proportion in mathematics is defined as two ratios that have equal values. This means that the comparison between the two ratios results in the same relationship or fraction. For example, if you have the ratio of 1:2 and you find another ratio, like 2:4, both of these ratios simplify to the same value (1/2), thereby forming a proportion. In practical terms, proportions are used to determine if two fractions are equivalent or to solve problems involving scale and comparison. The essence of a proportion lies in its equality, which allows for the cross-multiplication method to verify if two ratios are indeed equivalent. The other options reflect concepts that are related to ratios or fractions but do not accurately describe the definition of a proportion. Understanding the nature of proportions is key to solving many mathematical problems involving ratios and comparative relationships.

3. Which of the following statements is true regarding numbers to the right of the decimal point?

A. They are whole numbers

B. They have different terminology than whole numbers

C. They are always ignored in calculations

D. They cannot be less than ten

The statement is true because numbers to the right of the decimal point are indeed referred to by different terminology than whole numbers. In decimal notation, these numbers represent fractional parts of a whole and are classified as decimal fractions. For example, in the number 2.5, the "5" is in the tenths place, indicating it is five-tenths or one-half of a whole. This is distinct from whole numbers, which do not include decimal points or fractions. Understanding this distinction is important in mathematics, as it influences how numbers are manipulated and interpreted in calculations. Terminology associated with numbers to the right of the decimal includes terms like "tenths," "hundredths," and "thousandths," which help specify their value based on their position. Identifying and distinguishing these terms is crucial for proper mathematical communication and understanding.

4. What does the "HESI Hint" suggest is important for keeping problems aligned?

A. Using a calculator

B. Applying placeholders

C. Writing in pencil

D. Checking work carefully

The suggestion that applying placeholders is important for keeping problems aligned highlights a key strategy in mathematics, especially when dealing with multi-step calculations, long division, or when working with decimals. Placeholders help to maintain the correct positioning of numbers in relation to one another, particularly in addition and subtraction, where the alignment of digits directly affects the accuracy of the outcome. For instance, when adding or subtracting large numbers, using zeros as placeholders ensures that each digit is in the correct column (units, tens, hundreds, etc.)—this prevents misalignment that could lead to calculation errors. Additionally, in a long multiplication process, placeholders can clarify when to shift digits or when to regroup, thereby simplifying the overall calculation. While other strategies, such as careful checking of work or using a calculator, can also be important, they don't specifically address the maintenance of alignment during calculations as effectively as the use of placeholders does. Thus, emphasizing placeholders contributes significantly to achieving accurate results in mathematical operations.

5. How many milliliters are equivalent to 1 liter?

A. 500

B. 1,000

C. 2,000

D. 2,500

To understand why 1 liter is equivalent to 1,000 milliliters, it helps to know the metric system's conversion factors. In the metric system, the liter (L) and milliliter (mL) are both units of volume. Specifically, 1 liter is defined as 1,000 milliliters, making it a straightforward conversion. This relationship is based on the prefix "milli," which denotes a factor of one-thousandth (1/1,000). Therefore, when converting liters to milliliters, one simply multiplies by 1,000. So, if you have 1 liter, you multiply it by 1,000 to find the equivalent volume in milliliters. That leads us directly to the conclusion that 1 liter equals 1,000 milliliters, reaffirming the correct answer.

6. What is the equation to find out what percent a fraction exceeds another fraction?

A. (New fraction - Original fraction) / New fraction

B. (New fraction - Original fraction) / Original fraction × 100%

C. (Original fraction - New fraction) / New fraction

D. (New fraction + Original fraction) / Original fraction

To determine what percent a fraction exceeds another fraction, the formula needed is to take the difference between the new fraction and the original fraction, divide that difference by the original fraction, and then multiply by 100 to convert it into a percentage. This process effectively expresses the increase in terms of the original value, allowing for a clear understanding of how much greater the new fraction is compared to the original. By using this method, you are essentially calculating the relative change as a percentage. For example, if the original fraction is 1/4 and the new fraction is 1/2, you first find the difference: (1/2 - 1/4) = 1/4. Then, you divide this difference by the original fraction: (1/4) / (1/4) = 1, and multiply by 100%, which gives you 100%. Thus, the new fraction exceeds the original fraction by 100%. Utilizing this formula allows for easy comparison and clear interpretation of how much one fraction surpasses another in terms of percentage.

7. What is the term for the number that divides the dividend in a division problem?

A. Dividend

B. Divisor

C. Quotient

D. Remainder

In a division problem, the term used for the number that divides the dividend is known as the divisor. The dividend is the number being divided, while the divisor is the number you are dividing it by. For instance, in the division equation 12 ÷ 3 = 4, 12 is the dividend, 3 is the divisor, and 4 is the quotient, which is the result of the division. The remainder is what is left over after the division if the dividend does not divide evenly by the divisor. Understanding these terms is crucial when working with division, as they define the roles of the numbers involved in the operation.

8. What is the mean of the following numbers: 4, 8, 6, 5, 7?

A. 5

B. 6

C. 7

D. 8

To find the mean of a set of numbers, you add all the numbers together and then divide by the total count of the numbers. In this case, you have the numbers 4, 8, 6, 5, and 7. First, you add these numbers together: 4 + 8 + 6 + 5 + 7 = 30 Next, you count how many numbers there are in total, which is 5. Now, you divide the sum by the count: 30 ÷ 5 = 6 Thus, the mean of the numbers 4, 8, 6, 5, and 7 is 6. This is why the answer is 6, reflecting the average value around which the data set is centered.

9. What is 95% of 20?

A. 15

B. 18

C. 19

D. 20

To find 95% of 20, you first convert the percentage to a decimal by dividing by 100. Thus, 95% becomes 0.95. Next, you multiply this decimal by the number you are interested in, which is 20. So, the calculation would be: $0.95 \times 20 = 19$. This result shows that 95% of 20 is indeed 19. Understanding that percentages can be converted into decimals and then utilized in multiplication is crucial for solving similar problems.

10. How many meters are in a kilometer?

A. 100

B. 500

C. 1,000

D. 1,500

A kilometer is defined as equal to 1,000 meters. This metric conversion is based on the metric system, where the prefix 'kilo-' signifies a factor of one thousand. Therefore, when converting kilometers to meters, you multiply the number of kilometers by 1,000 to find the equivalent length in meters. For example, if you have 1 kilometer, you multiply by 1,000, resulting in 1,000 meters. Thus, the answer is indeed accurate, confirming that there are 1,000 meters in one kilometer.