

Select The Equation That Most Accurately Depicts The Word Problem. A Class Of 19 Pupils Has Five More

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Understanding how to translate a word problem into a mathematical equation is a fundamental skill in mathematics. When dealing with a problem like "A class of 19 pupils has five more," students are encouraged to identify the key information and formulate an equation that represents the scenario accurately. In this article, we will explore how to select the most appropriate equation for this type of word problem, discuss common mistakes to avoid, and provide step-by-step guidance for solving similar problems.

Understanding the Word Problem

Before selecting an equation, it is essential to thoroughly understand the problem's details.

Breaking Down the Scenario

- The problem states: "A class of 19 pupils has five more." This phrase indicates a comparison or addition involving the number of pupils.
- The phrase "has five more" suggests that one group or number exceeds another by five.

Identifying Key Information

- Total pupils in the class: 19
- Additional pupils: 5

Determining What the Problem Asks

- Typically, such problems ask for:
- The total number of pupils in a larger group
- The number of pupils in a subgroup
- How the total compares to another group

Formulating the Correct Equation

Selecting the correct equation hinges on interpreting the phrase "has five more" and translating it into algebraic terms.

Common Phrases and Their Mathematical Meanings

- "Has five more" usually means: one quantity is five greater than another.
- For example, if the total is 19 pupils, and this total "has five more" than some other number, then the other number is 5 fewer than 19.

Possible Interpretations

1. The class of 19 pupils is five more than another group (say, a previous class or subgroup).
2. The total number of pupils including an additional group is 19, which is five more than the original group.

Constructing the Equations

Based on the interpretations, the equations could be:

- *Equation 1:* $x + 5 = 19$
- *Equation 2:* $19 = x + 5$
- *Equation 3:* $19 = x - 5$
- *Equation 4:* $x = 19 + 5$

Note: The most accurate equation depends on the specific context of the problem, which should clarify whether 19 is the larger or smaller number.

Choosing the Most Accurate Equation

To select the most appropriate equation, consider the context and the wording carefully.

Scenario 1: The Class Has 5 More Pupils Than Another Group

- Suppose the class of 19 pupils has five more pupils than some smaller group, say, y pupils.
- Then, the equation would be: $y + 5 = 19$
- Solving this, $y = 14$, indicating the smaller group has 14 pupils.

Scenario 2: The Class of 19 Pupils Is 5 More Than a Previous Count

- If the previous count was x pupils, then:
- $x + 5 = 19$
- $x = 14$

Scenario 3: The Total Number of Pupils in Two Groups

- If the total number of pupils in two groups combined is 19, and one group has 5 more pupils than the other, then:
- Let x be the smaller group's size
- The larger group: $x + 5$
- Total: $x + (x + 5) = 19$
- Simplify: $2x + 5 = 19$
- Solve for x : $2x = 14 \rightarrow x = 7$
- Larger group: $7 + 5 = 12$

In this case, the equation that most accurately depicts the scenario is:
 $2x + 5 = 19$

Step-by-Step Guide to Solving Similar Word Problems

To simplify the process of selecting and solving equations for word problems involving "has five more," follow these steps:

Step 1: Read and Understand the Problem Carefully

- Identify the quantities involved.
- Highlight key phrases such as "has five more," "total," "difference," etc.

Step 2: Define Variables

- Assign variables to unknown quantities.
- For example, let x represent the smaller group size.

Step 3: Translate Words into Mathematical Expressions

- Use the key phrases to write equations.
- For example, "has five more" becomes: $\text{larger} = \text{smaller} + 5$.

Step 4: Formulate the Equation

- Combine the expressions based on the problem's context.
- For example, if total pupils are involved, write an expression for the total.

Step 5: Solve the Equation

- Use appropriate algebraic methods (addition, subtraction, multiplication, division).
- Check your solution in the context of the problem.

Step 6: Answer the Question

- Interpret the solution to match the question asked.

Common Mistakes to Avoid

Being aware of common pitfalls can help in accurately selecting and formulating equations.

Misinterpreting the Phrase "Has Five More"

- Remember it generally indicates a comparison or difference of five, not necessarily addition or subtraction depending on context.

Confusing Total and Difference

- Be clear whether the problem refers to total pupils, a difference between groups, or a comparison.

Incorrect Variable Assignment

- Assign variables that make sense for the scenario and avoid arbitrary choices.

Overcomplicating the Equation

- Keep the equation as simple as possible while accurately representing the problem.

Example Problem and Solution

Problem:

A class of 19 pupils has five more pupils than a smaller group. What is the size of the smaller group? Write the most accurate equation and solve it.

Solution:

1. Let x be the number of pupils in the smaller group.
2. Since the class has five more pupils than the smaller group, the class size is: $x + 5$.
3. The class size is given as 19, so:
 $x + 5 = 19$
4. Solve for x :
 $x = 19 - 5$
 $x = 14$
5. Answer: The smaller group has 14 pupils.

Equation that depicts the scenario most accurately:

$$x + 5 = 19$$

Summary:

By translating the word problem into an algebraic equation, we can clearly see the relationship between the quantities involved. Recognizing key phrases, defining variables appropriately, and solving the equations step-by-step are crucial skills for accurately modeling and solving such problems.

Conclusion

Selecting the correct equation for a word problem involving "has five more" requires careful reading, understanding of the context, and precise translation of words into mathematical expressions. Whether dealing with total counts, differences, or comparisons, the key is to interpret the phrase correctly and formulate an equation that reflects the scenario accurately. By following structured steps and avoiding common mistakes, students can confidently approach similar problems, improve their algebraic skills, and develop a deeper understanding of the relationships between quantities.

Remember, the most accurate equation depends on the specific details and wording of the problem, so always analyze carefully before solving.

Frequently Asked Questions

What is the first step in translating the word problem about the class of 19 pupils with five more into an equation?

Identify the total number of pupils and the part of the problem indicating 'five more' to set up an equation representing the relationship.

Which equation correctly represents the scenario where the class has five more pupils than a certain number?

If we let x represent the number of pupils in a smaller group, then the equation is $x + 5 = 19$.

How do you decide which equation best depicts the word problem involving the class size?

By matching the parts of the problem to the algebraic expressions, ensuring the equation reflects the total number of pupils and the 'five more' comparison.

What common mistake should be avoided when selecting the equation for this problem?

Avoid confusing the order of addition; for example, using $19 + 5$ instead of the correct $x + 5 = 19$.

If the problem states that the class has 19 pupils and five more than some smaller group, what is the correct equation to find that smaller group?

The correct equation is $x + 5 = 19$, where x represents the number of pupils in the smaller group.

How can you verify that the equation you selected accurately depicts the word problem?

By solving the equation and checking if the solution logically aligns with the original problem statement about the class size and 'five more' pupils.

Additional Resources

Select The Equation That Most Accurately Depicts The Word Problem. A Class Of 19 Pupils Has Five More – this is a common type of question encountered in algebra and word problem-solving exercises. Such problems require students to translate written scenarios into mathematical equations, a skill essential for developing quantitative reasoning and critical thinking. Correctly selecting the equation that best represents the problem is vital in ensuring accurate solutions and understanding of the underlying concepts.

In this comprehensive guide, we will explore how to approach such word problems systematically, analyze the typical language cues that indicate the correct mathematical relationship, and provide step-by-step strategies for selecting the most accurate equation. Whether you're a student preparing for exams or an educator designing assessments, mastering this skill can dramatically improve problem-solving proficiency.

Understanding the Nature of the Word Problem

Before diving into the equations, it's crucial to grasp the real-world scenario presented:

- Identify the key information: Read the problem carefully to understand what is being asked. Focus on numbers, units, and relationships described.
- Determine what is unknown: Recognize what quantity or value you need to find.
- Recognize the relationships: Look for words such as "more than," "less than," "total," "difference," "product," "per," "each," etc., which hint at the mathematical operation involved.

Example Scenario:

A class of 19 pupils has five more pupils than another class.

This simple scenario involves understanding the relationship between two classes based on their number of pupils.

Breaking Down the Word Problem

Step 1: Define Variables

Assign symbols to unknown quantities.
For instance:

- Let x = number of pupils in the smaller class
- Since the problem states "has five more," the larger class has $x + 5$ pupils

Step 2: Translate the Relationship into an Equation

Based on the wording:

- The larger class has five more pupils than the smaller class.
- The total number of pupils in both classes combined is 19.

Thus, the equation becomes:

$$x + (x + 5) = 19$$

Step 3: Simplify and Solve

- Combine like terms:

$$2x + 5 = 19$$

- Isolate x :

$$2x = 19 - 5$$

$$2x = 14$$

- Find x :

$$x = 14 / 2$$

$$x = 7$$

Now, the smaller class has 7 pupils, and the larger class has $7 + 5 = 12$ pupils.

Recognizing the Correct Equation

The key to selecting the correct equation from options lies in understanding the language cues:

Language Cue	Mathematical Relationship	Example in Context
"Has five more"	Larger quantity = smaller + 5	$x + 5$
"Total of 19 pupils"	Sum of classes = 19	$x + (x + 5) = 19$
"Pupils in another class"	Different classes, variables assigned separately	x and $x + 5$
"Difference of 5"	Larger - smaller = 5	$(x + 5) - x = 5$
"Per class"	Quantity per class	x in one class, $x + 5$ in another

Tip: Always match these cues to specific algebraic expressions.
Misinterpretation often leads to choosing an incorrect equation.

Common Mistakes and How to Avoid Them

Mistake 1: Confusing "more than" with "less than"

- Incorrect: Using subtraction when the phrase is "has five more"
- Correct: Addition, because "more than" indicates an increase

Mistake 2: Misidentifying the total sum

- Incorrect: Forgetting to include both classes in the total sum
- Correct: Sum of both classes equals the total (e.g., 19)

Mistake 3: Using the wrong variable assignment

- Incorrect: Assigning variables without understanding the relationship
- Correct: Clearly define variables based on the scenario

Practice: Selecting the Correct Equation

Suppose you are presented with the following options for the given problem:

- A) $x + (x + 5) = 19$
- B) $x - (x + 5) = 19$
- C) $(x + 5) - x = 19$
- D) $x + 5 = 19$

Analysis:

- Option A: Adds the two classes, which aligns with total pupils.
- Option B: Subtracts classes, not relevant here.
- Option C: Represents the difference between classes, which is 5, not total.
- Option D: Represents the larger class alone, not the total.

Correct choice: Option A

Extending the Concept: Variations of the Word Problem

Scenario 1: One class has twice as many pupils as the other

Approach:

- Let x = smaller class size
- Larger class = $2x$
- Total pupils = $x + 2x = 3x$

Equation: $x + 2x = \text{total pupils}$

Scenario 2: One class has 7 fewer pupils than another

Approach:

- Let x = larger class
- Smaller class = $x - 7$

Equation: $x + (x - 7) = \text{total pupils}$

Strategies for Effective Equation Selection

1. Read the problem carefully multiple times to identify the key relationships.
2. Translate words into algebraic expressions step-by-step.
3. Define variables explicitly to avoid confusion.
4. Match the language cues to mathematical operations.
5. Eliminate obviously incorrect options to narrow down choices.
6. Double-check that the equation reflects the scenario accurately before solving.

Summary

Selecting the most accurate equation that depicts a word problem is a critical skill in mathematics. It involves:

- Careful reading and comprehension of the problem statement.
- Recognizing key phrases like "more than," "less than," "total," "difference," etc.
- Translating these phrases into algebraic expressions using appropriate variables.
- Comparing the options and understanding why certain equations correctly model the scenario.

Mastering this process enhances problem-solving efficiency and builds a solid foundation for tackling more complex algebraic and word problems.

Final Tips

- Practice with diverse problems to internalize common language patterns.
- Always verify that your chosen equation aligns with the scenario before solving.
- Develop a habit of paraphrasing the problem in your own words to ensure clarity.

By cultivating these habits and understanding the nuances of language cues, students and educators can confidently select the correct equations that most accurately depict word problems, leading to better comprehension and mathematical proficiency.

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