Example Of Number Relation Problem With Solution

INTRODUCTION TO NUMBER RELATION PROBLEMS

Mathematics often feels abstract until we connect it to real-world scenarios. Among the most practical and intellectually stimulating categories of algebra are **number relation problems**. These problems ask us to find unknown numbers based on relationships like sums, differences, products, or ratios. Whether you are a student preparing for an exam, a parent helping with homework, or someone refreshing your math skills, understanding how to solve these problems is a valuable tool.

This article provides a clear **example of number relation problem with solution**, walking through multiple scenarios to build your confidence. We will explore consecutive integers, sums and differences, and problems involving digits. Each example is broken down step by step, ensuring you grasp not just the answer but the reasoning behind it. By the end, you will be able to approach any number relation problem systematically.

WHAT IS A NUMBER RELATION PROBLEM?

A number relation problem is a word problem where two or more numbers are linked by specific conditions. These conditions often involve addition, subtraction, multiplication, or division. The goal is to translate the words into algebraic equations and then solve for the unknowns.

Common types include:

- Finding two numbers when their sum and difference are known.
- Finding consecutive integers (like 3, 4, 5) when their sum is given.
- Problems where one number is a multiple of another.
- Digit problems involving the reversal of two-digit numbers.

Let us now examine a classic **example of number relation problem with solution** to see how this process works in practice.

EXAMPLE 1: SUM AND DIFFERENCE OF TWO NUMBERS

The Problem

The sum of two numbers is 45, and their difference is 13. What are the numbers?

Step 1: Define Variables

Let the larger number be **x** and the smaller number be **y**.

Step 2: Translate the Conditions

From the problem statement:

- Sum: x + y = 45
- Difference: x - y = 13

Step 3: Solve the System of Equations

We can use the elimination method. Add the two equations:

(x + y) + (x - y) = 45 + 13
2x = 58
x = 29

Now substitute x = 29 into the first equation:
29 + y = 45
y = 16

Step 4: Verify the Solution

Check the sum: 29 + 16 = 45. Check the difference: 29 - 16 = 13. Both conditions hold.

Answer: The two numbers are 29 and 16.

This straightforward **example of number relation problem with solution** shows how a system of linear equations resolves such questions quickly.

EXAMPLE 2: CONSECUTIVE INTEGERS

The Problem

Find three consecutive integers whose sum is 72.

Step 1: Define Variables

Let the first integer be **n**. Then the next two consecutive integers are **n + 1** and **n + 2**.

Step 2: Write the Equation

n + (n + 1) + (n + 2) = 72

Step 3: Simplify and Solve

3n + 3 = 72
3n = 69
n = 23

Step 4: Find the Integers

The integers are 23, 24, and 25.

Step 5: Verification

23 + 24 + 25 = 72. Correct.

Answer: The three consecutive integers are 23, 24, and 25.

Consecutive integer problems are a common **example of number relation problem with solution** in algebra textbooks, teaching the importance of representing sequences algebraically.

EXAMPLE 3: ONE NUMBER IS A MULTIPLE OF ANOTHER

The Problem

One number is three times another number. Their sum is 48. Find both numbers.

Step 1: Define Variables

Let the smaller number be **x**. Then the larger number is **3x**.

Step 2: Write the Equation

x + 3x = 48

Step 3: Solve

4x = 48
x = 12

Step 4: Find the Numbers

Smaller number: 12. Larger number: 3 × 12 = 36.

Step 5: Verification

12 + 36 = 48. Yes.

Answer: The numbers are 12 and 36.

This **example of number relation problem with solution** highlights how to handle multiplicative relationships, a frequent theme in word problems.

EXAMPLE 4: AGE AS A NUMBER RELATION

The Problem

Mary is 5 years older than John. In 10 years, the sum of their ages will be 55. How old are they now?

Step 1: Define Variables

Let John's current age be **j**. Then Mary's current age is **j + 5**.

Step 2: Write the Future Condition

In 10 years: John will be **j + 10**, Mary will be **(j + 5) + 10 = j + 15**.

The sum of these future ages is 55:
(j + 10) + (j + 15) = 55

Step 3: Solve

2j + 25 = 55
2j = 30
j = 15

Step 4: Find Current Ages

John is 15. Mary is 15 + 5 = 20.

Step 5: Verification

In 10 years: John 25, Mary 30. Sum = 55. Correct.

Answer: John is 15, Mary is 20.

Age problems are a practical **example of number relation problem with solution**, demonstrating how to model time-based relationships.

EXAMPLE 5: DIGIT PROBLEM WITH REVERSAL

The Problem

The tens digit of a two-digit number is twice the units digit. If the digits are reversed, the new number is 27 less than the original. Find the original number.

Step 1: Define Variables

Let the units digit be **u**. Then the tens digit is **2u**.

The original number is: 10 × (2u) + u = 20u + u = 21u.

The reversed number has tens digit u and units digit 2u, so it is: 10 × u + 2u = 10u + 2u = 12u.

Step 2: Write the Equation

The reversed number is 27 less than the original:
12u = 21u - 27

Step 3: Solve

Subtract 12u from both sides: 0 = 9u - 27
9u = 27
u = 3

Step 4: Find the Digits

Units digit: 3. Tens digit: 2 × 3 = 6.

Original number: 63. Reversed number: 36.

Step 5: Verification

Is the tens digit twice the units? 6 = 2 × 3. Yes. Is the reversed number 27 less? 63 - 36 = 27. Yes.

Answer: The original number is 63.

Digit problems are an elegant **example of number relation problem with solution**, combining place value with algebra.

EXAMPLE 6: RATIO OF TWO NUMBERS

The Problem

Two numbers are in the ratio 4:7. If the sum of the numbers is 66, find the numbers.

Step 1: Define Variables

Let the common factor be **k**. Then the numbers are 4k and 7k.

Step 2: Write the Equation

4k + 7k = 66

Step 3: Solve

11k = 66
k = 6

Step 4: Find the Numbers

First number: 4 × 6 = 24. Second number: 7 × 6 = 42.

Step 5: Verification

Ratio 24:42 simplifies to 4:7. Sum = 66. Correct.

Answer: The numbers are 24 and 42.

Ratio-based problems offer yet another **example of number relation problem with solution**, showing how to use a common multiplier to represent proportional relationships.

COMMON STRATEGIES FOR SOLVING NUMBER RELATION PROBLEMS

To tackle any **example of number relation problem with solution** effectively, follow these strategies:

1. **Read carefully:** Identify all conditions and relationships.
2. **Define variables:** Use letters to represent unknown numbers.
3. **Translate words to equations:** Write mathematical statements for each condition.
4. **Solve systematically:** Use substitution, elimination, or algebraic manipulation.
5. **Check your answers:** Always verify that your solution satisfies every condition.

Practicing with diverse examples builds fluency. The more **example of number relation problem with solution** you work through, the more intuitive the process becomes.

WHY NUMBER RELATION PROBLEMS MATTER

These problems are not just classroom exercises. They develop critical thinking and pattern recognition. In real life, we often compare quantities, split resources, or predict outcomes based on relationships. Mastering number relations equips you with a mental framework for logical analysis.

Furthermore, standardized tests frequently include such problems. A strong grasp of how to handle an **example of number relation problem with solution** can significantly boost test scores and mathematical confidence.

CONCLUSION

We have explored multiple scenarios, from simple sums and differences to digit reversals and ratios. Each **example of number relation problem with solution** reinforces the same core principle: translate words into equations, solve with algebra, and verify. With practice, you will find that these problems become enjoyable puzzles rather than obstacles.

Remember, mathematics is not about memorizing answers but about understanding processes. By internalizing the methods shown here, you can approach any number relation problem with clarity and confidence. Keep practicing, and soon you will be solving these problems with ease.