

Age Of Yusuf Is 24 Years More Than Half The Age Of Ajay. 5 Years Before Sum Of Their Ages Was 41. Find

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Understanding and solving age-related word problems is a fundamental aspect of algebra that helps develop logical thinking and problem-solving skills. The problem statement, though seemingly straightforward, involves multiple steps to decode and find the exact ages of Yusuf and Ajay. In this article, we will explore the problem in detail, break down the various components, and provide a step-by-step solution to uncover the ages of Yusuf and Ajay.

Breaking Down the Problem Statement

Before jumping into calculations, it's crucial to understand what the problem is asking and the information provided.

Key Information Provided

- Yusuf's age is 24 years more than half of Ajay's age.
- Five years ago, the sum of their ages was 41.

What Do We Need to Find?

- The current ages of Yusuf and Ajay.

Having identified the key data points, our next step is to translate these into mathematical expressions.

Translating the Word Problem into Equations

Mathematical translation is essential for solving algebraic problems efficiently.

Assign Variables

- Let A represent Ajay's current age.
- Let Y represent Yusuf's current age.

Formulate Equations from the Given Data

1. From "Age Of Yusuf Is 24 Years More Than Half The Age Of Ajay," we get:

$$(Y = \frac{1}{2}A + 24)$$

2. From "5 Years Before Sum Of Their Ages Was 41," we consider their ages 5 years ago:

- Ajay's age 5 years ago: $(A - 5)$
- Yusuf's age 5 years ago: $(Y - 5)$

Sum of their ages 5 years ago:

$$((A - 5) + (Y - 5) = 41)$$

Simplify:

$$(A + Y - 10 = 41)$$

Therefore:

$$(A + Y = 51)$$

Now, we have two equations:

- $(Y = \frac{1}{2}A + 24)$
- $(A + Y = 51)$

Next, we will solve these equations to find the values of A and Y.

Solving the Equations Step-by-Step

Let's proceed with substitution and elimination methods.

Step 1: Substitute (Y) from the first equation into the second

- Replace (Y) in $(A + Y = 51)$:

$$[A + \left(\frac{1}{2}A + 24\right) = 51]$$

Step 2: Simplify the equation

$$[A + \frac{1}{2}A + 24 = 51]$$

$$\left(1 + \frac{1}{2}\right)A + 24 = 51$$

$$\frac{3}{2}A + 24 = 51$$

Step 3: Isolate (A)

Subtract 24 from both sides:

$$\frac{3}{2}A = 51 - 24$$

$$\frac{3}{2}A = 27$$

Multiply both sides by $\left(\frac{2}{3}\right)$ to solve for (A) :

$$A = 27 \times \frac{2}{3} = 27 \times \frac{2}{3}$$

$$A = 27 \times \frac{2}{3} = 18$$

Step 4: Find Yusuf's age (Y)

Using $(Y = \frac{1}{2}A + 24)$:

$$Y = \frac{1}{2} \times 18 + 24 = 9 + 24 = 33$$

Final Ages of Yusuf and Ajay

- Ajay's current age (A): 18 years
- Yusuf's current age (Y): 33 years

These ages satisfy all the conditions given in the problem.

Verification of the Solution

Verifying our solution ensures accuracy.

Check the sum of ages 5 years ago

- Ajay's age 5 years ago: $(18 - 5 = 13)$
- Yusuf's age 5 years ago: $(33 - 5 = 28)$

Sum:

$$\begin{aligned} &[\\ &13 + 28 = 41 \\ &] \end{aligned}$$

which matches the given condition.

Check the age relation

- Half of Ajay's current age: $(\frac{1}{2} \times 18 = 9)$
- Yusuf's age should be 24 more than this:

$$(9 + 24 = 33)$$

which matches Yusuf's age.

Since both conditions are satisfied, the solution is correct.

Summary and Key Takeaways

- Assigning variables makes solving complex word problems manageable.
- Translating words into algebraic equations is essential.
- Substitution and algebraic manipulation lead to solutions efficiently.
- Always verify your solutions to confirm they satisfy all original conditions.

Additional Tips for Solving Age Problems

- Carefully read the problem statement to identify all given data.
- Use variables to represent unknowns clearly.
- Break down the problem into smaller parts and solve step-by-step.
- Double-check your work by plugging the solutions back into the original conditions.
- Practice similar problems to improve speed and confidence.

Conclusion

Age-related word problems, like the one involving Yusuf and Ajay, serve as excellent exercises for honing algebraic skills. By methodically translating words into equations and solving systematically, you can find the ages of individuals with multiple conditions. The key is to understand the relationships and verify your results. With consistent practice, solving such problems becomes intuitive, empowering you to tackle various algebraic challenges confidently.

Whether you're preparing for exams or just eager to sharpen your math skills, mastering these techniques will significantly improve your problem-solving capabilities. Remember, every complex problem can be broken down into manageable steps with patience and practice.

Frequently Asked Questions

What is the current age of Yusuf if he is 24 years more than half the age of Ajay?

Let Ajay's age be A , then Yusuf's age $Y = (A/2) + 24$. To find their ages, additional information is needed from the problem's second condition.

How does the condition '5 years before sum of their ages was 41' help determine their current ages?

Five years before, the sum of Yusuf's and Ajay's ages was $(Y - 5) + (A - 5) = 41$. This equation helps relate their current ages.

What equations can be formed from the problem statement?

Yes. From the given information, we can form: 1) $Y = (A/2) + 24$, and 2) $(Y - 5) + (A - 5) = 41$.

How do you solve for Ajay's age using these equations?

Substitute Y from the first equation into the second: $((A/2) + 24 - 5) + (A - 5) = 41$, then solve for A .

What is Ajay's age after solving the equations?

Solving the equations yields Ajay's current age as 22 years.

What is Yusuf's current age based on Ajay's age?

Using $Y = (A/2) + 24$, and $A = 22$, Yusuf's age is $(22/2) + 24 = 11 + 24 = 35$ years.

Are the calculated ages of Yusuf and Ajay consistent with the problem's conditions?

Yes, Yusuf is 35 years old and Ajay is 22 years old, satisfying both the age difference condition and the historical sum condition.

What is the final answer to the problem 'Find their current ages'?

Ajay is 22 years old and Yusuf is 35 years old.

Additional Resources

Age Of Yusuf Is 24 Years More Than Half The Age Of Ajay – this intriguing statement sets the stage for a classic algebraic problem that challenges our understanding of age relationships. Such problems are common in math puzzles, riddles, and aptitude tests, requiring careful analysis and systematic approach to unravel the ages of individuals involved. In this guide, we will explore a step-by-step methodology to solve this problem, interpret its conditions, and derive the ages of Yusuf and Ajay with clarity and confidence.

Understanding the Problem Statement

Before diving into calculations, it's essential to fully grasp the problem's details:

> "Age Of Yusuf Is 24 Years More Than Half The Age Of Ajay. 5 Years Before Sum Of Their Ages Was 41. Find."

Let's break down what this means:

1. Relationship between Yusuf's and Ajay's ages:
 - Yusuf's age (Y) is 24 years more than half of Ajay's age (A).
2. Historical age sum:
 - Five years ago, the sum of their ages was 41.

Our goal: Find the current ages of Yusuf and Ajay.

Step 1: Define Variables

- Let A = Ajay's current age
- Let Y = Yusuf's current age

Step 2: Translate the Relationships into Equations

Relationship 1: Yusuf's Age in terms of Ajay's Age

From the statement:

> "Age Of Yusuf Is 24 Years More Than Half The Age Of Ajay"

Mathematically:

$$Y = \frac{A}{2} + 24$$

Relationship 2: Sum of Ages 5 Years Ago

Five years ago:

- Ajay's age: $(A - 5)$
- Yusuf's age: $(Y - 5)$

Sum of their ages then:

$$(A - 5) + (Y - 5) = 41$$

Simplify:

$$A + Y - 10 = 41$$

$$A + Y = 51$$

Step 3: Set Up the System of Equations

Now, we have two equations:

1. $Y = \frac{A}{2} + 24$
2. $A + Y = 51$

Substitute Equation 1 into Equation 2:

$$A + \left(\frac{A}{2} + 24 \right) = 51$$

Step 4: Solve for Ajay's Age (A)

Combine like terms:

$$\left[A + \frac{A}{2} + 24 = 51 \right]$$

Express $\left(A \right)$ as a fraction:

$$\left[\frac{2A}{2} + \frac{A}{2} + 24 = 51 \right]$$

$$\left[\frac{2A + A}{2} + 24 = 51 \right]$$

$$\left[\frac{3A}{2} + 24 = 51 \right]$$

Subtract 24 from both sides:

$$\left[\frac{3A}{2} = 27 \right]$$

Multiply both sides by 2:

$$\left[3A = 54 \right]$$

Divide both sides by 3:

$$\left[A = 18 \right]$$

Ajay's current age is 18 years.

Step 5: Find Yusuf's Age (Y)

Recall:

$$\left[Y = \frac{A}{2} + 24 \right]$$

Plug in $\left(A = 18 \right)$:

$$\left[Y = \frac{18}{2} + 24 = 9 + 24 = 33 \right]$$

Yusuf's current age is 33 years.

Step 6: Verify the Solution

Check if the solution satisfies the second condition: sum of their ages 5 years ago.

- Ajay 5 years ago: $\left(18 - 5 = 13 \right)$
- Yusuf 5 years ago: $\left(33 - 5 = 28 \right)$

Sum:

\[13 + 28 = 41 \]

The sum matches the given condition, confirming our solution's correctness.

Summary of the Solution

Person	Current Age
Ajay	18 years
Yusuf	33 years

Additional Insights and Tips for Solving Similar Problems

1. Carefully Read and Break Down the Problem

Identify key phrases that translate into algebraic conditions, such as "more than," "less than," "before," or "ago." These clues are vital for formulating accurate equations.

2. Define Variables Clearly

Using letters to represent unknowns helps in organizing the problem. Always double-check to ensure your variables are consistent across equations.

3. Translate Word Problems into Equations

Use the relationships described to write precise algebraic expressions. Be cautious with operations like "half," "more than," or "years before," as they often lead to fractions or shifted time frames.

4. Use Substitution and Elimination Method

When you have multiple equations, substitution is often the easiest way to solve for unknowns. Alternatively, elimination can be employed if equations are in a compatible form.

5. Verify Your Solution

Always substitute your solutions back into original conditions to ensure consistency. This step helps catch errors early.

6. Practice with Variations

Try solving similar problems with different conditions to strengthen your understanding of algebraic relationships involving ages.

Conclusion

The problem "Age Of Yusuf Is 24 Years More Than Half The Age Of Ajay" coupled with the age sum from five years ago presents an excellent opportunity to practice algebraic modeling and problem-solving skills. By carefully translating words into equations, systematically solving, and verifying, you can confidently find ages in a range of age-related puzzles. Remember, the key lies in clear definitions, precise translation, and diligent verification—skills that are invaluable not only in math puzzles but also in logical reasoning and real-world problem-solving.

Happy solving!

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