

ARIEL, WHO IS 15, IS 3 YEARS MORE THAN TWICE THE AGE OF HILARY. HOW OLD IS HILARY?

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UNDERSTANDING THE AGES OF INDIVIDUALS BASED ON GIVEN RELATIONSHIPS CAN SOMETIMES BE TRICKY BUT ALSO QUITE INTERESTING. IN THIS ARTICLE, WE WILL EXPLORE A SPECIFIC PROBLEM INVOLVING ARIEL AND HILARY'S AGES. WE WILL ANALYZE THE STATEMENT: "ARIEL, WHO IS 15, IS 3 YEARS MORE THAN TWICE THE AGE OF HILARY," AND DETERMINE HILARY'S EXACT AGE THROUGH CLEAR, STEP-BY-STEP REASONING. WHETHER YOU'RE A STUDENT LOOKING FOR HELP WITH ALGEBRAIC WORD PROBLEMS OR SOMEONE INTERESTED IN AGE PUZZLES, THIS GUIDE WILL HELP YOU UNDERSTAND HOW TO APPROACH SUCH PROBLEMS METHODICALLY.

UNDERSTANDING THE PROBLEM STATEMENT

BEFORE DIVING INTO CALCULATIONS, IT'S ESSENTIAL TO INTERPRET THE PROBLEM ACCURATELY. THE STATEMENT SAYS:

> ARIEL, WHO IS 15, IS 3 YEARS MORE THAN TWICE THE AGE OF HILARY.

THIS SENTENCE CONTAINS KEY INFORMATION:

- ARIEL'S AGE: 15 YEARS
- RELATIONSHIP BETWEEN ARIEL'S AGE AND HILARY'S AGE: "3 YEARS MORE THAN TWICE THE AGE OF HILARY"

OUR GOAL: FIND HILARY'S AGE.

BREAKING DOWN THE PROBLEM

TO SOLVE THE PROBLEM SYSTEMATICALLY, WE WILL:

1. IDENTIFY WHAT IS KNOWN
2. TRANSLATE THE STATEMENT INTO AN ALGEBRAIC EQUATION
3. SOLVE THE EQUATION FOR HILARY'S AGE

LET'S PROCEED STEP-BY-STEP.

STEP 1: DEFINE VARIABLES

ASSIGN A VARIABLE TO UNKNOWN QUANTITIES:

- LET H = HILARY'S AGE IN YEARS

SINCE ARIEL'S AGE IS KNOWN (15), AND THE PROBLEM RELATES ARIEL'S AGE TO HILARY'S, OUR VARIABLE H WILL HELP US FORMULATE THE RELATIONSHIP.

STEP 2: EXPRESS THE RELATIONSHIP ALGEBRAICALLY

THE KEY PHRASE IS:

> ARIEL IS 3 YEARS MORE THAN TWICE HILARY'S AGE.

THIS CAN BE INTERPRETED AS:

- ARIEL'S AGE = $2 \times$ HILARY'S AGE + 3

EXPRESSED MATHEMATICALLY:

$$\begin{aligned} & \backslash[\\ & 15 = 2H + 3 \\ & \backslash] \end{aligned}$$

WHY?

- "TWICE HILARY'S AGE" = $2H$

- "3 YEARS MORE THAN" = $+ 3$

- SO, ARIEL'S AGE (15) EQUALS THIS AMOUNT.

STEP 3: SOLVE THE ALGEBRAIC EQUATION

NOW, WE CAN ISOLATE H :

$$\begin{aligned} & \backslash[\\ & 15 = 2H + 3 \\ & \backslash] \end{aligned}$$

SUBTRACT 3 FROM BOTH SIDES:

$$\begin{aligned} & \backslash[\\ & 15 - 3 = 2H \\ & \backslash] \end{aligned}$$

$$\begin{aligned} & \backslash[\\ & 12 = 2H \\ & \backslash] \end{aligned}$$

DIVIDE BOTH SIDES BY 2:

$$\begin{aligned} & \backslash[\\ & H = \frac{12}{2} = 6 \\ & \backslash] \end{aligned}$$

So, Hilary is 6 years old.

Answer: How Old Is Hilary?

Based on the calculations, Hilary is 6 years old.

Additional Insights and Context

While the primary question has been answered, let's explore some related points and common scenarios related to age problems.

1. Validity of the Assumption

- The problem assumes that age relationships are linear and can be expressed algebraically.
- It's important to interpret phrases carefully, especially words like "more than" or "less than."

2. Real-Life Context

- Age problems like this often appear in math exercises to develop algebraic thinking.
- Such problems are common in standardized tests and classroom activities.

3. Variations of the Problem

- If the statement were slightly different, the solution would change accordingly.
- For example, if it said "Ariel is 3 years less than twice Hilary's age," the equation would be:

$$\begin{aligned} &15 = 2H - 3 \end{aligned}$$

and solving for H would give a different age.

Common Mistakes to Avoid in Age Word Problems

When solving age-related word problems, students often make the following errors:

1. Misinterpreting the phrase "more than" versus "less than"
2. Incorrectly setting up the algebraic equation
3. Forgetting to subtract or add appropriately when isolating variables

4. ASSUMING AGES ARE NEGATIVE OR UNREALISTIC VALUES

5. OVERCOMPLICATING SIMPLE RELATIONSHIPS

BY CAREFULLY READING THE PROBLEM AND TRANSLATING WORDS INTO ALGEBRA, YOU CAN AVOID THESE COMMON PITFALLS.

SUMMARY AND FINAL THOUGHTS

IN SUMMARY, BY CAREFULLY ANALYZING THE STATEMENT "ARIEL, WHO IS 15, IS 3 YEARS MORE THAN TWICE THE AGE OF HILARY," WE TRANSLATED THE WORDS INTO AN ALGEBRAIC EQUATION:

$$\begin{aligned} & \backslash \\ & 15 = 2H + 3 \\ & \backslash \end{aligned}$$

SOLVING FOR H REVEALED THAT HILARY IS 6 YEARS OLD.

UNDERSTANDING SUCH PROBLEMS ENHANCES YOUR ALGEBRAIC REASONING AND PROBLEM-SOLVING SKILLS. WHETHER FOR ACADEMIC PURPOSES OR GENERAL REASONING, MASTERING HOW TO TRANSLATE WORD PROBLEMS INTO EQUATIONS IS INVALUABLE.

KEY TAKEAWAYS:

- ALWAYS IDENTIFY KNOWN AND UNKNOWN QUANTITIES.
- TRANSLATE WORDS INTO ALGEBRAIC EXPRESSIONS CAREFULLY.
- SOLVE THE EQUATIONS STEP-BY-STEP, CHECKING YOUR WORK.
- INTERPRET THE SOLUTION IN THE CONTEXT OF THE PROBLEM TO ENSURE IT MAKES SENSE.

WE HOPE THIS DETAILED EXPLANATION CLARIFIES HOW TO APPROACH AND SOLVE AGE-RELATED WORD PROBLEMS LIKE THIS ONE. PRACTICE SIMILAR PROBLEMS TO IMPROVE YOUR SKILLS, AND YOU'LL FIND THESE TYPES OF PUZZLES BECOMING EASIER OVER TIME.

META-DESCRIPTION: DISCOVER HOW TO DETERMINE HILARY'S AGE BASED ON THE RELATIONSHIP WITH ARIEL, WHO IS 15, AND LEARN STEP-BY-STEP METHODS TO SOLVE AGE WORD PROBLEMS WITH CONFIDENCE.

FREQUENTLY ASKED QUESTIONS

HOW OLD IS ARIEL IF SHE IS 3 YEARS MORE THAN TWICE HILARY'S AGE AND ARIEL IS 15?

ARIEL IS 15 YEARS OLD, WHICH MEANS HILARY IS 6 YEARS OLD.

WHAT IS THE AGE OF HILARY IF ARIEL IS 15 AND ARIEL'S AGE IS 3 YEARS MORE THAN TWICE HILARY'S?

HILARY IS 6 YEARS OLD.

How do you find Hilary's age given Ariel's age and the relationship between their ages?

Set up the equation: Ariel's age = $2 \times \text{Hilary's age} + 3$. Plug in Ariel's age (15) and solve for Hilary's age.

What equation represents the relationship between Ariel's and Hilary's ages?

Ariel's age = $2 \times \text{Hilary's age} + 3$.

Is Hilary older or younger than Ariel?

Hilary is younger than Ariel, since Ariel is 15 and Hilary is 6.

How do you verify the solution for Hilary's age?

Calculate twice Hilary's age and add 3; if it equals Ariel's age (15), the solution is correct.

Can you explain step-by-step how to find Hilary's age in this problem?

Yes. First, write the equation: $15 = 2 \times \text{Hilary's age} + 3$. Subtract 3 from both sides: $12 = 2 \times \text{Hilary's age}$. Divide both sides by 2: Hilary's age = 6.

What is the significance of the '3 years more' in the problem?

It indicates that Ariel's age exceeds twice Hilary's age by 3 years, which helps set up the equation.

If Ariel were 21 instead of 15, how old would Hilary be?

Using the same relationship: $21 = 2 \times \text{Hilary's age} + 3$. Subtract 3: $18 = 2 \times \text{Hilary's age}$. Divide by 2: Hilary is 9 years old.

Why is understanding the relationship between ages important in solving such problems?

It helps to translate word problems into algebraic equations, making it easier to find the unknown ages accurately.

Additional Resources

Ariel, Who Is 15, Is 3 Years More Than Twice The Age Of Hilary. How Old Is Hilary?

Understanding the ages of individuals in word problems can often seem straightforward but actually involves careful interpretation of the language used. In this case, we are presented with a scenario involving two young individuals, Ariel and Hilary, with specific relationships between their ages. The problem states: "Ariel, who is 15, is 3 years more than twice the age of Hilary." To uncover Hilary's age, it is essential to analyze the statement meticulously, break down the mathematical relationship, and understand the underlying logic.

This article will explore this problem step-by-step, providing a comprehensive understanding of how to translate verbal statements into algebraic expressions, interpret the relationships correctly, and perform the necessary calculations. Additionally, the discussion will contextualize the importance of precise language comprehension in solving word problems, especially in educational settings, and will include a detailed analysis

OF POTENTIAL PITFALLS AND COMMON MISCONCEPTIONS.

DECIPHERING THE PROBLEM STATEMENT

UNDERSTANDING THE KEY PHRASES

THE CORE SENTENCE PROVIDED IS: "ARIEL, WHO IS 15, IS 3 YEARS MORE THAN TWICE THE AGE OF HILARY." SEVERAL KEY PHRASES REQUIRE CAREFUL INTERPRETATION:

- "ARIEL, WHO IS 15": THIS PART CLEARLY STATES ARIEL'S AGE AS 15 YEARS.
- "IS 3 YEARS MORE THAN": THIS INDICATES THAT ARIEL'S AGE EXCEEDS SOME QUANTITY BY 3 YEARS.
- "TWICE THE AGE OF HILARY": THIS PHRASE INDICATES A DOUBLING OF HILARY'S AGE.

THE CRITICAL TASK IS TO TRANSLATE THIS VERBAL DESCRIPTION INTO AN ALGEBRAIC EQUATION THAT ACCURATELY REFLECTS THE RELATIONSHIP.

POTENTIAL AMBIGUITIES IN LANGUAGE

WHILE THE STATEMENT SEEMS STRAIGHTFORWARD, IT'S VITAL TO RECOGNIZE POTENTIAL AMBIGUITIES:

- DOES "3 YEARS MORE THAN TWICE THE AGE OF HILARY" MEAN:
 1. ARIEL'S AGE = $(2 \times \text{HILARY'S AGE}) + 3$?
 2. OR, ARIEL'S AGE = $2 \times (\text{HILARY'S AGE} + 3)$?
- THE LATTER WOULD SUGGEST A DIFFERENT RELATIONSHIP AND LEADS TO DIFFERENT CALCULATIONS.

IN TYPICAL WORD PROBLEMS, THE PHRASE "MORE THAN" USUALLY INDICATES ADDITION AFTER THE DOUBLED QUANTITY, I.E., THE FIRST INTERPRETATION.

ESTABLISHING THE MATHEMATICAL RELATIONSHIP

INTERPRETING THE STATEMENT CORRECTLY

BASED ON COMMON MATHEMATICAL LANGUAGE CONVENTIONS, THE PHRASE:

"ARIEL IS 3 YEARS MORE THAN TWICE THE AGE OF HILARY"

IS MOST NATURALLY INTERPRETED AS:

$$\text{ARIEL'S AGE} = (2 \times \text{HILARY'S AGE}) + 3$$

THIS INTERPRETATION ALIGNS WITH STANDARD READING: "MORE THAN" TRANSLATES TO AN ADDITION.

NOTE: IF THE PROBLEM INTENDED THE OTHER INTERPRETATION, IT WOULD HAVE EXPLICITLY USED PARENTHESES OR PHRASING SUCH AS "TWICE THE AGE OF HILARY PLUS 3" OR "THE AGE OF HILARY PLUS 3, DOUBLED," WHICH IS LESS TYPICAL.

FORMULATING THE EQUATION

GIVEN THAT ARIEL'S AGE IS 15, AND CONSIDERING THE INTERPRETATION ABOVE, WE CAN SET UP THE EQUATION:

$$15 = (2 \times \text{HILARY'S AGE}) + 3$$

LET (H) REPRESENT HILARY'S AGE.

THUS,

$$[15 = 2H + 3]$$

THIS IS A STRAIGHTFORWARD LINEAR EQUATION THAT CAN BE SOLVED FOR (H) .

SOLVING FOR HILARY'S AGE

STEP-BY-STEP CALCULATION

STARTING FROM THE ALGEBRAIC EQUATION:

$$[15 = 2H + 3]$$

SUBTRACT 3 FROM BOTH SIDES:

$$[15 - 3 = 2H]$$

$$[12 = 2H]$$

DIVIDE BOTH SIDES BY 2:

$$[H = \frac{12}{2}]$$

$$[H = 6]$$

THEREFORE, HILARY IS 6 YEARS OLD.

VERIFICATION OF THE SOLUTION

TO ENSURE THE SOLUTION MAKES SENSE, SUBSTITUTE $(H = 6)$ BACK INTO THE ORIGINAL RELATIONSHIP:

- TWICE HILARY'S AGE: $(2 \times 6 = 12)$

- ADD 3: $(12 + 3 = 15)$

- THIS MATCHES ARIEL'S AGE EXACTLY, CONFIRMING THE CORRECTNESS OF THE SOLUTION.

CONTEXTUAL ANALYSIS AND ADDITIONAL CONSIDERATIONS

THE IMPORTANCE OF PRECISE LANGUAGE IN WORD PROBLEMS

THIS PROBLEM EXEMPLIFIES THE CRITICAL ROLE OF PRECISE LANGUAGE INTERPRETATION IN MATHEMATICAL WORD PROBLEMS. SMALL DIFFERENCES IN PHRASING CAN SIGNIFICANTLY ALTER THE MEANING AND THE RESULTING CALCULATIONS.

FOR EXAMPLE, IF THE STATEMENT HAD BEEN:

- "ARIEL IS TWICE THE AGE OF HILARY PLUS 3", IT WOULD BE INTERPRETED AS:

$[15 = 2H + 3]$ (WHICH MATCHES OUR CURRENT INTERPRETATION).

- BUT, IF IT HAD BEEN "ARIEL'S AGE IS TWICE THE SUM OF HILARY'S AGE AND 3," THEN:

$[15 = 2(H + 3)]$

WHICH SIMPLIFIES TO:

$[15 = 2H + 6]$, LEADING TO A DIFFERENT SOLUTION.

THIS DEMONSTRATES THE IMPORTANCE OF CAREFULLY ANALYZING THE LANGUAGE.

IMPLICATIONS OF THE SOLUTION

KNOWING HILARY'S AGE AS 6 YEARS OLD HAS VARIOUS EDUCATIONAL AND SOCIAL IMPLICATIONS:

- DEVELOPMENTAL MILESTONE: AT AGE 6, HILARY IS TYPICALLY IN EARLY ELEMENTARY SCHOOL, WHICH CAN INFLUENCE DISCUSSIONS ABOUT AGE-APPROPRIATE ACTIVITIES OR COMPARISONS.

- RELATIVE AGE: ARIEL, AT 15, IS A TEENAGER, AND THE AGE DIFFERENCE IS SIGNIFICANT, HIGHLIGHTING TYPICAL AGE GAPS SEEN IN SIBLING OR PEER RELATIONSHIPS.

- MATHEMATICAL LITERACY: THE PROCESS DEMONSTRATES HOW TRANSLATING WORDS INTO EQUATIONS IS A VITAL SKILL IN MATHEMATICS EDUCATION, FOSTERING CRITICAL THINKING AND PROBLEM-SOLVING ABILITIES.

POTENTIAL PITFALLS AND MISCONCEPTIONS

MISINTERPRETING "MORE THAN" AND "TWICE"

ONE COMMON MISCONCEPTION IS MISINTERPRETING THE PHRASE "MORE THAN" AS "LESS THAN" OR CONFUSING THE ORDER OF OPERATIONS. IT'S ESSENTIAL TO RECOGNIZE THAT:

- "A IS 3 YEARS MORE THAN B" = $(A = B + 3)$
- "TWICE THE AGE OF HILARY" = $(2 \times \text{HILARY'S AGE})$
- COMBINING THESE: "ARIEL IS 3 YEARS MORE THAN TWICE HILARY" = $(A = 2H + 3)$

OVERLOOKING THE NEED FOR VARIABLES

ANOTHER MISTAKE IS ATTEMPTING TO SOLVE THE PROBLEM WITHOUT INTRODUCING VARIABLES, LEADING TO CONFUSION. ASSIGNING A CLEAR VARIABLE (E.G., (H)) FOR HILARY'S AGE HELPS ORGANIZE THE PROBLEM AND AVOID ERRORS.

ASSUMING DIFFERENT INTERPRETATIONS WITHOUT JUSTIFICATION

ALWAYS VERIFY THE INTERPRETATION BY TESTING THE SOLUTION. IF THE CALCULATED AGE SATISFIES THE ORIGINAL STATEMENT, IT'S LIKELY CORRECT. IF NOT, RECONSIDER THE ASSUMPTIONS.

CONCLUSION: FINAL INSIGHTS AND BROADER IMPLICATIONS

THE PROBLEM INVOLVING ARIEL AND HILARY UNDERSCORES THE IMPORTANCE OF CAREFUL LANGUAGE ANALYSIS IN MATHEMATICAL CONTEXTS. THROUGH PROPER INTERPRETATION, ALGEBRAIC TRANSLATION, AND METHODICAL CALCULATION, WE FIND THAT HILARY IS 6 YEARS OLD. THIS PROCESS EXEMPLIFIES HOW FOUNDATIONAL SKILLS IN READING COMPREHENSION, ALGEBRA, AND LOGICAL REASONING INTERSECT IN SOLVING REAL-WORLD MATH PROBLEMS.

MOREOVER, SUCH PROBLEMS SERVE AS VALUABLE TEACHING TOOLS, EMPHASIZING THE NEED FOR PRECISION IN COMMUNICATION AND THE POWER OF ALGEBRA AS A UNIVERSAL LANGUAGE FOR EXPRESSING RELATIONSHIPS. MASTERY OF THESE SKILLS NOT ONLY ENHANCES STUDENTS' MATHEMATICAL PROFICIENCY BUT ALSO IMPROVES THEIR ANALYTICAL THINKING AND PROBLEM-SOLVING CAPABILITIES—ESSENTIAL COMPETENCIES IN TODAY'S DATA-DRIVEN WORLD.

IN EDUCATIONAL PRACTICE, ENCOURAGING STUDENTS TO DISSECT WORD PROBLEMS CAREFULLY, VERIFY THEIR SOLUTIONS, AND RECOGNIZE POTENTIAL AMBIGUITIES FOSTERS DEEPER UNDERSTANDING AND CONFIDENCE. AS DEMONSTRATED IN THIS SCENARIO, CLARITY IN LANGUAGE AND SYSTEMATIC REASONING ARE THE KEYS TO UNLOCKING SOLUTIONS AND DEVELOPING MATHEMATICAL LITERACY.

SUMMARY:

- ARIEL IS 15 YEARS OLD.
- THE STATEMENT "ARIEL IS 3 YEARS MORE THAN TWICE THE AGE OF HILARY" TRANSLATES TO $(15 = 2H + 3)$.
- SOLVING YIELDS $(H = 6)$.
- THEREFORE, HILARY IS 6 YEARS OLD.

THIS COMPREHENSIVE ANALYSIS ILLUSTRATES THE IMPORTANCE OF PRECISE LANGUAGE INTERPRETATION AND ALGEBRAIC REASONING IN SOLVING AGE-RELATED WORD PROBLEMS.

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