

ETHAN AND FRANCIS SHARE SOME MONEY IN THE RATIO 3 : 5. ETHAN RECEIVES 90 LESS THAN FRANCIS. WORK OUT HOW

ETHAN AND FRANCIS SHARE SOME MONEY IN THE RATIO 3 : 5. ETHAN RECEIVES 90 LESS THAN FRANCIS. WORK OUT HOW

UNDERSTANDING HOW MONEY IS SHARED BETWEEN TWO INDIVIDUALS BASED ON RATIOS IS A COMMON MATHEMATICAL PROBLEM THAT TESTS OUR ABILITY TO INTERPRET RELATIONSHIPS AND PERFORM ALGEBRAIC CALCULATIONS. IN THIS ARTICLE, WE WILL EXPLORE A SPECIFIC SCENARIO WHERE ETHAN AND FRANCIS SHARE A SUM OF MONEY IN THE RATIO 3:5, AND ETHAN RECEIVES 90 LESS THAN FRANCIS. WE WILL WORK THROUGH THE PROBLEM SYSTEMATICALLY TO DETERMINE THE TOTAL AMOUNT OF MONEY SHARED AND THE INDIVIDUAL AMOUNTS RECEIVED BY ETHAN AND FRANCIS. WHETHER YOU'RE A STUDENT PREPARING FOR EXAMS OR SIMPLY INTERESTED IN PROBLEM-SOLVING, THIS COMPREHENSIVE GUIDE WILL CLARIFY THE STEPS INVOLVED.

UNDERSTANDING THE PROBLEM

BEFORE DIVING INTO CALCULATIONS, IT'S ESSENTIAL TO UNDERSTAND THE KEY DETAILS OF THE PROBLEM:

- ETHAN AND FRANCIS SHARE A TOTAL SUM OF MONEY.
- THE RATIO OF THEIR SHARES IS 3:5.
- ETHAN RECEIVES 90 LESS THAN FRANCIS.

OUR GOAL IS TO FIND OUT HOW MUCH MONEY WAS SHARED IN TOTAL AND HOW MUCH ETHAN AND FRANCIS RECEIVED INDIVIDUALLY.

ASSIGNING VARIABLES TO THE SHARES

TO APPROACH THE PROBLEM MATHEMATICALLY, WE ASSIGN VARIABLES TO THE SHARES BASED ON THE RATIO.

DEFINE THE RATIO VARIABLES

LET:

- ETHAN'S SHARE = $3x$
- FRANCIS'S SHARE = $5x$

HERE, x IS A COMMON MULTIPLYING FACTOR THAT SCALES THE RATIO TO ACTUAL AMOUNTS.

EXPRESSING THE DIFFERENCE IN SHARES

ACCORDING TO THE PROBLEM:

- ETHAN RECEIVES 90 LESS THAN FRANCIS.

THIS GIVES US THE EQUATION:

$$\text{FRANCIS'S SHARE} - \text{ETHAN'S SHARE} = 90$$

SUBSTITUTING THE VARIABLES:

$$5x - 3x = 90$$

SIMPLIFY:

$$2x = 90$$

SOLVE FOR X:

$$x = \left(\frac{90}{2}\right) = 45$$

NOW, WE KNOW THE VALUE OF X AND CAN FIND INDIVIDUAL SHARES.

CALCULATING INDIVIDUAL SHARES

USING THE VALUE OF X, CALCULATE ETHAN'S AND FRANCIS'S SHARES:

- ETHAN'S SHARE = $3x = 3 \times 45 = 135$
- FRANCIS'S SHARE = $5x = 5 \times 45 = 225$

THEREFORE:

- ETHAN RECEIVES 135 UNITS OF MONEY.
- FRANCIS RECEIVES 225 UNITS OF MONEY.

CALCULATING THE TOTAL SUM SHARED

THE TOTAL AMOUNT OF MONEY SHARED IS THE SUM OF ETHAN'S AND FRANCIS'S SHARES:

$$\text{TOTAL} = \text{ETHAN'S SHARE} + \text{FRANCIS'S SHARE} = 135 + 225 = 360$$

TOTAL MONEY SHARED IS 360 UNITS.

SUMMARY OF FINDINGS

PERSON	SHARE	AMOUNT
ETHAN	3x	135
FRANCIS	5x	225
TOTAL	8x	360

THIS TABLE SUMMARIZES THE DISTRIBUTION AND TOTAL SUM BASED ON THE RATIO AND THE GIVEN DIFFERENCE.

ADDITIONAL TIPS FOR SOLVING RATIO AND DIFFERENCE PROBLEMS

WHEN DEALING WITH PROBLEMS WHERE TWO QUANTITIES ARE IN A RATIO AND HAVE A SPECIFIC DIFFERENCE, CONSIDER THE FOLLOWING:

STEP-BY-STEP APPROACH

1. ASSIGN VARIABLES TO EACH SHARE BASED ON THE RATIO.
2. WRITE AN EQUATION REPRESENTING THE DIFFERENCE OR OTHER GIVEN RELATIONSHIPS.
3. SUBSTITUTE THE VARIABLES INTO THE EQUATION AND SOLVE FOR THE COMMON FACTOR (x).
4. CALCULATE INDIVIDUAL SHARES USING THE VALUE OF x.
5. DETERMINE THE TOTAL SUM BY ADDING INDIVIDUAL SHARES.

COMMON PITFALLS TO AVOID

- MIXING UP THE RATIO PARTS AND THE ACTUAL AMOUNTS.
- FORGET TO MULTIPLY THE RATIO PARTS BY THE COMMON FACTOR.
- NOT CORRECTLY SETTING UP THE EQUATION BASED ON THE DIFFERENCE.

REAL-WORLD APPLICATIONS OF RATIO PROBLEMS

RATIO PROBLEMS ARE NOT JUST ACADEMIC EXERCISES—THEY HAVE PRACTICAL APPLICATIONS IN FINANCE, ECONOMICS, COOKING, AND RESOURCE ALLOCATION. UNDERSTANDING HOW TO INTERPRET RATIOS AND DIFFERENCES HELPS IN BUDGETING, DIVIDING RESOURCES, AND MAKING FAIR DISTRIBUTIONS.

CONCLUSION

By carefully assigning variables and translating the word problem into algebraic equations, we found that Ethan received 135 units of money, Francis received 225 units, and the total shared amount was 360 units. The key steps involved recognizing the ratio, setting up the appropriate equations, solving for the common factor, and then deriving individual amounts.

This approach demonstrates the power of algebra in solving real-world problems involving ratios and differences. Whether you're tackling similar math exercises or applying these skills in everyday scenarios, mastering these techniques will enhance your problem-solving abilities and confidence.

If you encounter more ratio-based questions or need further clarification, remember to break down the problem into manageable parts, define your variables clearly, and proceed step-by-step. With practice, these problems become straightforward and rewarding to solve.

FREQUENTLY ASKED QUESTIONS

WHAT IS THE TOTAL AMOUNT OF MONEY ETHAN AND FRANCIS SHARE IF THEIR RATIO IS 3:5 AND ETHAN RECEIVES 90 LESS THAN FRANCIS?

Let the amount Francis receives be $5x$ and Ethan be $3x$. Given Ethan receives 90 less, so $5x - 3x = 90$, which gives $2x = 90$, so $x = 45$. Therefore, Ethan receives $3 \times 45 = 135$ and Francis receives $5 \times 45 = 225$.

HOW DO YOU SET UP THE EQUATION TO FIND EACH PERSON'S SHARE WHEN ETHAN GETS 90 LESS THAN FRANCIS IN A 3:5 RATIO?

Assign Ethan's share as $3x$ and Francis's as $5x$. Since Ethan gets 90 less, set up the equation: $5x - 3x = 90$, then solve for x .

WHAT IS THE AMOUNT ETHAN RECEIVES IN THIS PROBLEM?

Ethan receives 135 units of money.

WHAT IS THE AMOUNT FRANCIS RECEIVES IN THIS PROBLEM?

Francis receives 225 units of money.

CAN YOU EXPLAIN WHY WE USE THE RATIO 3:5 TO FIND THEIR RESPECTIVE SHARES?

The ratio 3:5 indicates Ethan's share is 3 parts and Francis's is 5 parts. This helps set up proportional equations to find their individual amounts.

WHAT IS THE SIGNIFICANCE OF THE '90 LESS' CONDITION IN SOLVING THIS PROBLEM?

It establishes a relationship between Ethan's and Francis's shares, allowing us to set up an equation to find the value of each part in the ratio.

IF ETHAN RECEIVES 135, HOW MUCH DOES FRANCIS RECEIVE, AND DOES IT MATCH THE GIVEN RATIO?

Francis receives 225, and the ratio of Ethan to Francis is 135:225, which simplifies to 3:5, matching the given

RATIO.

WHAT IS THE STEP-BY-STEP PROCESS TO SOLVE FOR THEIR SHARES IN THIS PROBLEM?

1. ASSIGN VARIABLES: ETHAN = $3x$, FRANCIS = $5x$. 2. USE THE CONDITION: $5x - 3x = 90$. 3. SIMPLIFY AND SOLVE FOR x : $2x = 90$, $x = 45$. 4. CALCULATE ETHAN'S SHARE: $3 \times 45 = 135$. 5. CALCULATE FRANCIS'S SHARE: $5 \times 45 = 225$.

WHAT OTHER TYPES OF PROBLEMS INVOLVE SHARING AMOUNTS IN A RATIO WITH A DIFFERENCE BETWEEN SHARES?

SUCH PROBLEMS INCLUDE DIVIDING PROFITS, DISTRIBUTING INHERITANCE, SHARING FOOD OR RESOURCES, AND PARTITIONING QUANTITIES IN PROPORTIONAL PARTS WITH GIVEN DIFFERENCES.

WHY IS IT IMPORTANT TO UNDERSTAND RATIOS AND THEIR APPLICATIONS IN REAL-WORLD PROBLEMS?

UNDERSTANDING RATIOS HELPS IN MAKING PROPORTIONATE COMPARISONS, SOLVING SHARING PROBLEMS, AND MAKING INFORMED DECISIONS INVOLVING PARTS OF A WHOLE IN EVERYDAY LIFE AND VARIOUS FIELDS LIKE FINANCE, ENGINEERING, AND STATISTICS.

ADDITIONAL RESOURCES

ETHAN AND FRANCIS SHARE SOME MONEY IN THE RATIO 3 : 5. ETHAN RECEIVES 90 LESS THAN FRANCIS. WORK OUT HOW — THIS INTRIGUING PROBLEM COMBINES RATIO ANALYSIS WITH BASIC ALGEBRA, OFFERING A PRACTICAL EXAMPLE OF HOW MATHEMATICAL CONCEPTS CAN BE APPLIED TO REAL-WORLD SCENARIOS. WHETHER YOU'RE A STUDENT BRUSHING UP ON RATIOS OR SOMEONE INTERESTED IN FINANCIAL DISTRIBUTIONS, UNDERSTANDING HOW TO APPROACH SUCH PROBLEMS CAN BE INCREDIBLY USEFUL. IN THIS COMPREHENSIVE GUIDE, WE'LL BREAK DOWN THE PROBLEM STEP-BY-STEP, EXPLORE THE UNDERLYING CONCEPTS, AND WALK YOU THROUGH THE SOLUTION PROCESS IN DETAIL.

UNDERSTANDING THE PROBLEM

BEFORE DIVING INTO CALCULATIONS, IT'S CRUCIAL TO UNDERSTAND WHAT THE PROBLEM IS ASKING. LET'S RESTATE THE KEY POINTS:

- ETHAN AND FRANCIS SHARE SOME AMOUNT OF MONEY.
- THEIR SHARES ARE IN THE RATIO 3 : 5.
- ETHAN RECEIVES 90 LESS THAN FRANCIS.
- THE GOAL IS TO FIND OUT THE TOTAL AMOUNT SHARED OR THE INDIVIDUAL AMOUNTS.

THIS PROBLEM INVOLVES TWO MAIN IDEAS:

1. RATIO OF SHARES: ETHAN'S SHARE IS PROPORTIONAL TO 3 PARTS, AND FRANCIS'S IS PROPORTIONAL TO 5 PARTS.
2. DIFFERENCE IN AMOUNTS RECEIVED: ETHAN RECEIVES 90 LESS THAN FRANCIS, WHICH SETS UP AN EQUATION RELATING THE TWO SHARES.

STEP 1: ASSIGN VARIABLES BASED ON THE RATIO

WHEN DEALING WITH RATIOS, A COMMON APPROACH IS TO ASSIGN VARIABLES TO THE PARTS:

- LET THE COMMON MULTIPLIER FOR THE RATIO BE x .
- THEREFORE:
- ETHAN'S SHARE = $3x$

- FRANCIS'S SHARE = $5x$

THIS MAKES IT EASIER TO EXPRESS THEIR AMOUNTS MATHEMATICALLY.

STEP 2: TRANSLATE THE DIFFERENCE INTO AN EQUATION

ACCORDING TO THE PROBLEM:

> ETHAN RECEIVES 90 LESS THAN FRANCIS.

SUBSTITUTING THE EXPRESSIONS:

FRANCIS'S SHARE - ETHAN'S SHARE = 90

$$\text{?} \quad 5x - 3x = 90$$

$$\text{?} \quad 2x = 90$$

STEP 3: SOLVE FOR THE MULTIPLIER x

FROM THE ABOVE:

$$2x = 90$$

DIVIDING BOTH SIDES BY 2:

$$x = 45$$

THIS MEANS EACH PART OF THE RATIO CORRESPONDS TO 45 UNITS OF MONEY.

STEP 4: FIND INDIVIDUAL SHARES

USING $x = 45$:

$$\text{- ETHAN'S SHARE} = 3x = 3 \times 45 = 135$$

$$\text{- FRANCIS'S SHARE} = 5x = 5 \times 45 = 225$$

STEP 5: VERIFY THE SOLUTION

CHECK WHETHER ETHAN'S SHARE IS INDEED 90 LESS THAN FRANCIS':

$$225 - 135 = 90$$

YES, THE DIFFERENCE MATCHES THE PROBLEM STATEMENT, CONFIRMING OUR SOLUTION.

STEP 6: FIND THE TOTAL MONEY SHARED

THE TOTAL AMOUNT SHARED IS THE SUM OF BOTH SHARES:

$$\text{TOTAL} = \text{ETHAN'S SHARE} + \text{FRANCIS'S SHARE}$$

$$\text{P} \quad 135 + 225 = 360$$

SUMMARY OF THE SOLUTION

STEP	CALCULATION	RESULT
ASSIGN RATIO PARTS	ETHAN = $3x$, FRANCIS = $5x$	-
SET UP DIFFERENCE EQUATION	$5x - 3x = 90$	$2x = 90$
SOLVE FOR x	$x = 90 / 2$	$x = 45$
FIND INDIVIDUAL SHARES	ETHAN = $3(45) = 135$, FRANCIS = $5(45) = 225$	-
VERIFY	$225 - 135 = 90$	CORRECT
TOTAL SHARED	$135 + 225 = 360$	TOTAL AMOUNT SHARED

ADDITIONAL INSIGHTS AND VARIATIONS

WHAT IF THE PROBLEM ASKED FOR THE TOTAL AMOUNT SHARED INSTEAD?

IN THIS CASE, WE'VE ALREADY CALCULATED IT AS 360.

HOW WOULD THE SOLUTION CHANGE IF ETHAN RECEIVED MORE THAN FRANCIS?

SUPPOSE ETHAN RECEIVED MORE THAN FRANCIS, SAY BY 90, THEN:

$$\text{ETHAN'S SHARE} - \text{FRANCIS'S SHARE} = 90$$

THE EQUATION BECOMES:

$$3x - 5x = 90$$

$$\text{P} \quad -2x = 90$$

$$\text{P} \quad x = -45$$

A NEGATIVE VALUE INDICATES AN INCONSISTENCY (SINCE AMOUNTS CAN'T BE NEGATIVE), WHICH SUGGESTS THE INITIAL ASSUMPTION ABOUT WHO RECEIVED MORE IS INCORRECT OR THE PROBLEM'S PARAMETERS NEED ADJUSTMENT.

REAL-WORLD APPLICATIONS

THIS TYPE OF RATIO PROBLEM IS COMMON IN:

- DIVIDING PROFITS OR RESOURCES PROPORTIONALLY
- DISTRIBUTING INHERITANCE
- SPLITTING COSTS AMONG FRIENDS OR PARTNERS

UNDERSTANDING HOW TO SET UP AND SOLVE THESE EQUATIONS CAN HELP IN BUDGETING, FINANCIAL PLANNING, AND EVEN NEGOTIATING SHARES.

TIPS FOR SOLVING SIMILAR RATIO PROBLEMS

1. ALWAYS DEFINE VARIABLES CLEARLY BASED ON THE RATIO.
2. TRANSLATE THE PROBLEM STATEMENT INTO AN ALGEBRAIC EQUATION.

3. CHECK THE SOLUTION BY SUBSTITUTING BACK INTO THE ORIGINAL CONDITIONS.
4. BE MINDFUL OF THE CONTEXT—WHO RECEIVES MORE OR LESS CAN CHANGE THE SETUP.
5. PRACTICE WITH DIFFERENT RATIOS TO BECOME COMFORTABLE WITH VARIOUS SCENARIOS.

FINAL THOUGHTS

THE PROBLEM ETHAN AND FRANCIS SHARE SOME MONEY IN THE RATIO 3 : 5. ETHAN RECEIVES 90 LESS THAN FRANCIS. WORK OUT HOW IS A CLASSIC EXAMPLE OF APPLYING RATIO AND ALGEBRA TO REAL-WORLD-LIKE SITUATIONS. BY SYSTEMATICALLY ASSIGNING VARIABLES, SETTING UP EQUATIONS, AND SOLVING STEP-BY-STEP, WE FIND THAT ETHAN RECEIVES 135, FRANCIS RECEIVES 225, AND THE TOTAL SHARED AMOUNT IS 360. MASTERING SUCH PROBLEMS ENHANCES YOUR MATHEMATICAL REASONING AND PREPARES YOU TO TACKLE A WIDE RANGE OF PRACTICAL SHARING AND DISTRIBUTION CHALLENGES.

REMEMBER: RATIOS ARE POWERFUL TOOLS WHEN DIVIDING RESOURCES, AND BREAKING DOWN COMPLEX PROBLEMS INTO MANAGEABLE STEPS CAN MAKE EVEN THE MOST INTIMIDATING QUESTIONS APPROACHABLE. HAPPY SOLVING!

Ethan And Francis Share Some money In The Ratio 3 : 5 Ethan Receives 90 Less Than Francis Work Out How

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