

PERFORM THE FOLLOWING DIVISION. SHOW THE MULTIPLICATION YOU WOULD DO TO MAKE THE DIVISOR A WHOLE NUMBER.

PERFORM THE FOLLOWING DIVISION. SHOW THE MULTIPLICATION YOU WOULD DO TO MAKE THE DIVISOR A WHOLE NUMBER.

DIVIDING NUMBERS IS A FUNDAMENTAL SKILL IN MATHEMATICS THAT APPEARS FREQUENTLY IN VARIOUS REAL-LIFE SITUATIONS, FROM CALCULATING GROCERY BILLS TO SOLVING COMPLEX ALGEBRAIC PROBLEMS. ONE COMMON CHALLENGE IN DIVISION PROBLEMS INVOLVES DEALING WITH DIVISORS THAT ARE NOT WHOLE NUMBERS, ESPECIALLY FRACTIONS OR DECIMALS. TO SIMPLIFY SUCH DIVISION PROBLEMS, MATHEMATICIANS OFTEN USE A TECHNIQUE CALLED "MAKING THE DIVISOR A WHOLE NUMBER" BY MULTIPLYING BOTH THE DIVIDEND AND DIVISOR BY A SUITABLE NUMBER. THIS PROCESS PRESERVES THE VALUE OF THE DIVISION WHILE TRANSFORMING IT INTO A MORE STRAIGHTFORWARD CALCULATION.

IN THIS COMPREHENSIVE GUIDE, WE WILL EXPLORE THE METHODS TO PERFORM DIVISION PROBLEMS WHERE THE DIVISOR IS A FRACTION OR DECIMAL, DEMONSTRATING HOW TO FIND THE APPROPRIATE MULTIPLICATION FACTOR TO CONVERT THE DIVISOR INTO A WHOLE NUMBER. WE WILL ALSO PROVIDE STEP-BY-STEP EXAMPLES, TIPS, AND PRACTICE EXERCISES TO ENHANCE UNDERSTANDING AND MASTERY OF THIS ESSENTIAL MATHEMATICAL TECHNIQUE.

UNDERSTANDING DIVISION WITH NON-WHOLE DIVISORS

WHAT IS A DIVISOR?

IN DIVISION, THE DIVISOR IS THE NUMBER BY WHICH ANOTHER NUMBER (THE DIVIDEND) IS DIVIDED. FOR EXAMPLE, IN THE DIVISION PROBLEM $12 \div 3$, THE DIVISOR IS 3.

WHY CONVERT DIVISORS TO WHOLE NUMBERS?

DIVIDING BY WHOLE NUMBERS IS GENERALLY EASIER AND REDUCES THE LIKELIHOOD OF ERRORS. WHEN THE DIVISOR IS A FRACTION OR DECIMAL, CALCULATIONS CAN BECOME CUMBERSOME. CONVERTING THE DIVISOR TO A WHOLE NUMBER SIMPLIFIES THE DIVISION PROCESS, ESPECIALLY WHEN PERFORMING MANUAL CALCULATIONS OR USING BASIC CALCULATORS.

TECHNIQUES FOR MAKING THE DIVISOR A WHOLE NUMBER

THE KEY IDEA IS TO MULTIPLY BOTH THE DIVIDEND AND THE DIVISOR BY A SUITABLE NUMBER SO THAT THE DIVISOR BECOMES A WHOLE NUMBER. THIS IS BASED ON THE PROPERTY OF EQUALITY:

MULTIPLYING NUMERATOR AND DENOMINATOR BY THE SAME NON-ZERO NUMBER DOES NOT CHANGE THE VALUE OF A FRACTION.

EXAMPLE:

SUPPOSE YOU HAVE $\frac{3}{4} \div 0.2$. TO SIMPLIFY THIS, WE CAN MULTIPLY BOTH THE DIVIDEND AND DIVISOR BY A NUMBER THAT TURNS 0.2 INTO A WHOLE NUMBER.

STEP-BY-STEP METHOD

1. IDENTIFY THE DIVISOR AND DETERMINE WHETHER IT IS A FRACTION OR DECIMAL.
2. FIND THE LEAST COMMON MULTIPLE (LCM) OR THE NECESSARY MULTIPLIER TO CONVERT THE DIVISOR INTO A WHOLE NUMBER.
3. MULTIPLY BOTH THE DIVIDEND AND DIVISOR BY THIS NUMBER.
4. PERFORM THE DIVISION WITH THE NEW NUMBERS.

COMMON STRATEGIES

- FOR DECIMALS: MULTIPLY NUMERATOR AND DENOMINATOR BY POWERS OF 10 UNTIL THE DIVISOR BECOMES A WHOLE NUMBER.
- FOR FRACTIONS: MULTIPLY NUMERATOR AND DENOMINATOR BY THE LEAST COMMON MULTIPLE OF DENOMINATORS IF THE DIVISOR IS A COMPLEX FRACTION.

CONVERTING DECIMALS TO WHOLE NUMBERS

WHEN THE DIVISOR IS A DECIMAL, THE GOAL IS TO ELIMINATE THE DECIMAL POINT BY MULTIPLYING BOTH THE DIVIDEND AND DIVISOR BY AN APPROPRIATE POWER OF 10.

EXAMPLE 1: DIVIDE $45.6 \div 0.8$

STEP 1: IDENTIFY THE DIVISOR: 0.8

STEP 2: DETERMINE THE MULTIPLIER: SINCE 0.8 HAS ONE DECIMAL PLACE, MULTIPLY BOTH NUMBERS BY 10.

STEP 3: MULTIPLY BOTH NUMBERS BY 10:

- $45.6 \times 10 = 456$
- $0.8 \times 10 = 8$

STEP 4: REWRITE THE DIVISION:

$$456 \div 8$$

STEP 5: PERFORM THE DIVISION:

$$456 \div 8 = 57$$

RESULT: $45.6 \div 0.8 = 57$

EXAMPLE 2: DIVIDE $3.75 \div 0.25$

STEP 1: THE DIVISOR IS 0.25.

STEP 2: SINCE 0.25 HAS TWO DECIMAL PLACES, MULTIPLY BOTH NUMBERS BY 100.

STEP 3: MULTIPLY:

- $3.75 \times 100 = 375$
- $0.25 \times 100 = 25$

STEP 4: PERFORM DIVISION:

$$375 \div 25 = 15$$

RESULT: $3.75 \div 0.25 = 15$

CONVERTING FRACTIONS TO WHOLE NUMBERS

FOR DIVISION INVOLVING FRACTIONS, THE PROCESS INVOLVES CLEARING THE FRACTION BY MULTIPLYING NUMERATOR AND DENOMINATOR BY THE LEAST COMMON MULTIPLE (LCM) OF THE DENOMINATORS.

EXAMPLE 3: DIVIDE $2/3 \div 4/5$

STEP 1: RECOGNIZE THE DIVISION OF TWO FRACTIONS.

STEP 2: TO MAKE THE DIVISOR ($4/5$) A WHOLE NUMBER, MULTIPLY NUMERATOR AND DENOMINATOR BY 5:

$$- 4/5 \times 5/5 = 20/25$$

BUT THIS DOESN'T MAKE THE DIVISOR A WHOLE NUMBER DIRECTLY. INSTEAD, IT'S EASIER TO FOLLOW THE COMMON APPROACH:

- METHOD: MULTIPLY BOTH DIVIDEND AND DIVISOR BY THE LCM OF THEIR DENOMINATORS (3 AND 5), WHICH IS 15.

STEP 3: MULTIPLY NUMERATOR AND DENOMINATOR OF BOTH FRACTIONS BY 15:

$$- \text{DIVIDEND: } 2/3 \times 15/15 = (2 \times 15) / (3 \times 15) = 30/45$$

$$- \text{DIVISOR: } 4/5 \times 15/15 = (4 \times 15) / (5 \times 15) = 60/75$$

STEP 4: REWRITE THE DIVISION:

$$(30/45) \div (60/75)$$

STEP 5: INSTEAD OF DIVIDING FRACTIONS DIRECTLY, CONVERT DIVISION OF FRACTIONS INTO MULTIPLICATION BY THE RECIPROCAL:

$$(30/45) \times (75/60)$$

SIMPLIFY:

$$- 30/45 = 2/3 \text{ (DIVIDING NUMERATOR AND DENOMINATOR BY 15)}$$

$$- 75/60 = 5/4 \text{ (DIVIDING NUMERATOR AND DENOMINATOR BY 15)}$$

STEP 6: MULTIPLY:

$$(2/3) \times (5/4) = (2 \times 5) / (3 \times 4) = 10/12$$

SIMPLIFY:

$$10/12 = 5/6 \text{ (DIVIDING NUMERATOR AND DENOMINATOR BY 2)}$$

$$\text{FINAL ANSWER: } 2/3 \div 4/5 = 5/6$$

PRACTICAL TIPS FOR MAKING DIVISORS WHOLE

- ALWAYS IDENTIFY THE TYPE OF DIVISOR: DECIMAL OR FRACTION.
- FOR DECIMALS, MULTIPLY BOTH NUMBERS BY 10, 100, 1000, ETC., DEPENDING ON THE NUMBER OF DECIMAL PLACES.
- FOR COMPLEX FRACTIONS, CONSIDER MULTIPLYING NUMERATOR AND DENOMINATOR BY THE LCM OF DENOMINATORS.
- REMEMBER THAT MULTIPLYING BOTH NUMBERS BY THE SAME NON-ZERO NUMBER DOES NOT CHANGE THE VALUE OF THE DIVISION.
- SIMPLIFY ANSWERS WHENEVER POSSIBLE TO THEIR LOWEST TERMS.

ADDITIONAL EXAMPLES AND PRACTICE EXERCISES

PRACTICE PROBLEM 1:

DIVIDE $7.2 \div 0.6$. SHOW THE MULTIPLICATION YOU WOULD DO TO MAKE THE DIVISOR A WHOLE NUMBER.

SOLUTION:

- 0.6 HAS 1 DECIMAL PLACE, SO MULTIPLY BOTH BY 10:
- $7.2 \times 10 = 72$
- $0.6 \times 10 = 6$
- DIVISION: $72 \div 6 = 12$
- ANSWER: $7.2 \div 0.6 = 12$

PRACTICE PROBLEM 2:

DIVIDE $5/8 \div 3/4$. SHOW HOW TO CONVERT THE DIVISOR TO A WHOLE NUMBER.

SOLUTION:

- FIND LCM OF DENOMINATORS 8 AND 4, WHICH IS 8.
- MULTIPLY NUMERATOR AND DENOMINATOR OF BOTH FRACTIONS BY 8:
- $5/8 \times 8/8 = 40/64$
- $3/4 \times 8/8 = 24/32$
- SIMPLIFY:
- $40/64 = 5/8$ (DIVIDING NUMERATOR AND DENOMINATOR BY 8)
- $24/32 = 3/4$ (DIVIDING NUMERATOR AND DENOMINATOR BY 8)
- OR, BETTER APPROACH:

RECOGNIZE THAT DIVIDING FRACTIONS IS EQUIVALENT TO MULTIPLYING BY THE RECIPROCAL:

$$(5/8) \div (3/4) = (5/8) \times (4/3) = (5 \times 4) / (8 \times 3) = 20/24 = 5/6 \text{ AFTER SIMPLIFICATION.}$$

$$\text{ANSWER: } 5/8 \div 3/4 = 5/6$$

CONCLUSION

MASTERING THE TECHNIQUE OF TRANSFORMING DIVISORS INTO WHOLE NUMBERS IS ESSENTIAL FOR EFFICIENT AND ACCURATE DIVISION CALCULATIONS. WHETHER WORKING WITH DECIMALS OR FRACTIONS, MULTIPLYING BOTH THE DIVIDEND AND DIVISOR BY AN APPROPRIATE NUMBER PRESERVES THE VALUE OF THE DIVISION WHILE SIMPLIFYING THE PROCESS. REMEMBER TO IDENTIFY THE DECIMAL PLACES OR DENOMINATORS, FIND THE SUITABLE MULTIPLIER, AND PERFORM THE CALCULATIONS SYSTEMATICALLY.

PRACTICING THESE METHODS ENHANCES YOUR NUMERICAL FLUENCY AND CONFIDENCE IN TACKLING A WIDE RANGE OF MATHEMATICAL PROBLEMS. WITH CONSISTENT PRACTICE, YOU'LL FIND THAT DIVISION PROBLEMS INVOLVING NON-WHOLE DIVISORS BECOME MANAGEABLE AND STRAIGHTFORWARD, MAKING YOUR OVERALL MATH SKILLS STRONGER AND MORE VERSATILE.

ADDITIONAL RESOURCES

- ONLINE DIVISION PRACTICE TOOLS: WEBSITES LIKE KHAN ACADEMY AND MATH PLAYGROUND OFFER INTERACTIVE EXERCISES.
- MATH TEXTBOOKS: LOOK FOR SECTIONS ON FRACTIONS, DECIMALS, AND DIVISION FOR MORE IN-DEPTH EXPLANATIONS.
- TUTORING AND STUDY GROUPS: COLLABORATE WITH PEERS OR TUTORS TO REINFORCE THESE CONCEPTS.

BY UNDERSTANDING AND APPLYING THESE STRATEGIES, YOU'LL BE WELL-EQUIPPED TO PERFORM DIVISION OPERATIONS EFFICIENTLY, ENSURING

FREQUENTLY ASKED QUESTIONS

HOW DO I CONVERT A DIVISION PROBLEM LIKE $48 \div 0.8$ INTO A WHOLE NUMBER DIVISOR?

MULTIPLY BOTH THE DIVIDEND AND DIVISOR BY 10 TO ELIMINATE THE DECIMAL: $48 \times 10 = 480$ AND $0.8 \times 10 = 8$. THEN, PERFORM $480 \div 8$.

WHAT IS THE STEP TO MAKE A DIVISOR A WHOLE NUMBER WHEN IT CONTAINS A DECIMAL?

MULTIPLY BOTH THE NUMERATOR AND DENOMINATOR BY THE SAME POWER OF 10 TO SHIFT THE DECIMAL POINT UNTIL THE DIVISOR BECOMES A WHOLE NUMBER. FOR EXAMPLE, MULTIPLY BY 10, 100, OR 1000 AS NEEDED.

IF I HAVE $75 \div 0.25$, HOW SHOULD I PERFORM THE MULTIPLICATION TO MAKE THE DIVISOR WHOLE?

MULTIPLY BOTH NUMBERS BY 100: $75 \times 100 = 7500$ AND $0.25 \times 100 = 25$. THEN, DIVIDE 7500 BY 25.

WHY DO WE MULTIPLY BOTH THE DIVIDEND AND DIVISOR BY THE SAME NUMBER WHEN DIVIDING WITH DECIMALS?

TO KEEP THE VALUE OF THE DIVISION THE SAME WHILE CONVERTING THE DIVISOR INTO A WHOLE NUMBER, SIMPLIFYING THE CALCULATION.

CAN YOU GIVE AN EXAMPLE OF MAKING A DIVISOR A WHOLE NUMBER IN DIVISION PROBLEMS INVOLVING FRACTIONS?

YES. FOR EXAMPLE, TO DIVIDE $\frac{3}{4}$ BY 0.2, MULTIPLY NUMERATOR AND DENOMINATOR BY 10: $\frac{3}{4} \times \frac{10}{10} = \frac{30}{40}$, AND $0.2 \times 10 = 2$. THEN, DIVIDE $\frac{30}{40}$ BY 2.

WHAT IS THE GENERAL METHOD FOR PERFORMING DIVISION WHEN THE DIVISOR IS NOT A

WHOLE NUMBER?

MULTIPLY BOTH THE DIVIDEND AND DIVISOR BY THE SAME POWER OF 10 TO TURN THE DIVISOR INTO A WHOLE NUMBER, THEN PROCEED WITH THE DIVISION.

ADDITIONAL RESOURCES

DIVISION TRANSFORMATION: MAKING DIVISORS WHOLE FOR SEAMLESS CALCULATIONS

IN THE REALM OF MATHEMATICS, DIVISION IS A FUNDAMENTAL OPERATION THAT OFTEN PRESENTS CHALLENGES WHEN DEALING WITH NON-WHOLE (OR FRACTIONAL) DIVISORS. WHETHER YOU'RE A STUDENT AIMING FOR CLARITY, A TEACHER SEEKING TO SIMPLIFY TEACHING METHODS, OR A PROFESSIONAL WORKING THROUGH COMPLEX CALCULATIONS, TRANSFORMING DIVISORS INTO WHOLE NUMBERS CAN SIGNIFICANTLY STREAMLINE THE PROCESS. THIS ARTICLE DELVES INTO THE TECHNIQUES AND REASONING BEHIND PERFORMING SPECIFIC MULTIPLICATIONS TO CONVERT DIVISORS INTO WHOLE NUMBERS, ILLUSTRATING THE PROCESS STEP-BY-STEP TO ENSURE CLARITY AND CONFIDENCE IN YOUR CALCULATIONS.

UNDERSTANDING THE NEED FOR DIVISOR TRANSFORMATION

BEFORE DIVING INTO THE METHODS, IT'S ESSENTIAL TO COMPREHEND WHY CONVERTING A DIVISOR INTO A WHOLE NUMBER IS BENEFICIAL.

WHY CONVERT DIVISORS?

- SIMPLIFIES CALCULATIONS: DIVIDING BY WHOLE NUMBERS IS GENERALLY MORE STRAIGHTFORWARD THAN DIVIDING BY FRACTIONS OR DECIMALS. IT REDUCES POTENTIAL ERRORS AND MAKES MENTAL MATH EASIER.
- FACILITATES CLARITY: WHEN THE DIVISOR IS A WHOLE NUMBER, THE DIVISION PROCESS BECOMES TRANSPARENT, WHICH IS ESPECIALLY HELPFUL IN TEACHING ENVIRONMENTS OR COMPLEX CALCULATIONS.
- ENABLES EASIER USE OF LONG DIVISION: TRADITIONAL LONG DIVISION METHODS ARE DESIGNED FOR WHOLE NUMBER DIVISORS, SO TRANSFORMING THE DIVISOR ALIGNS WITH THIS STANDARD TECHNIQUE.

COMMON SCENARIOS REQUIRING TRANSFORMATION

- DIVIDING BY FRACTIONS LIKE $\frac{1}{2}$, $\frac{1}{3}$, $\frac{5}{8}$, ETC.
- DIVIDING BY DECIMALS SUCH AS 0.25, 0.75, ETC.
- WORKING WITH RATIOS OR PROPORTIONS THAT INVOLVE FRACTIONAL DIVISORS.

CORE CONCEPT: MULTIPLYING TO CONVERT DIVISORS INTO WHOLE NUMBERS

THE CENTRAL IDEA IS TO FIND A NUMBER (CALLED A MULTIPLIER) BY WHICH YOU CAN MULTIPLY BOTH THE DIVIDEND (THE NUMBER BEING DIVIDED) AND THE DIVISOR (THE NUMBER YOU'RE DIVIDING BY) SO THAT THE DIVISOR BECOMES A WHOLE NUMBER.

THE PRINCIPLE

IF YOU HAVE A DIVISION PROBLEM LIKE:

$$A \div B$$

AND B IS NOT A WHOLE NUMBER, THEN:

- FIND A NUMBER k SUCH THAT $b \times k$ IS A WHOLE NUMBER.
- MULTIPLY BOTH NUMERATOR AND DENOMINATOR BY k , TRANSFORMING THE DIVISION INTO:

$$(a \times k) \div (b \times k)$$

- SINCE $b \times k$ IS NOW A WHOLE NUMBER, THE DIVISION BECOMES MORE STRAIGHTFORWARD.

THIS PROCESS IS ROOTED IN THE PROPERTY THAT MULTIPLYING NUMERATOR AND DENOMINATOR BY THE SAME NUMBER DOES NOT CHANGE THE VALUE OF THE DIVISION.

STEP-BY-STEP APPROACH TO DIVIDING BY A NON-WHOLE DIVISOR

LET'S EXPLORE THE METHOD THROUGH A SYSTEMATIC, STEP-BY-STEP GUIDE, COMPLEMENTED BY ILLUSTRATIVE EXAMPLES.

STEP 1: IDENTIFY THE DIVISOR

DETERMINE WHETHER THE DIVISOR IS A FRACTION, DECIMAL, OR A DECIMAL THAT CAN BE CONVERTED INTO A FRACTION.

EXAMPLE: DIVIDE 48 BY 0.75.

STEP 2: CONVERT THE DIVISOR INTO A FRACTION

EXPRESS THE DIVISOR AS A FRACTION IN SIMPLEST FORM.

- FOR 0.75, SINCE $0.75 = 75/100$, SIMPLIFIED TO $3/4$.

STEP 3: DETERMINE THE MULTIPLIER

FIND THE RECIPROCAL OF THE DENOMINATOR IN THE FRACTIONAL FORM TO CONVERT THE DIVISOR INTO A WHOLE NUMBER.

- FOR $3/4$, THE RECIPROCAL IS 4.
- MULTIPLY BOTH NUMERATOR AND DENOMINATOR BY 4:

$$\left[\frac{3}{4} \times \frac{4}{4} = \frac{3 \times 4}{4 \times 4} = \frac{12}{16} \right]$$

BUT MORE STRAIGHTFORWARDLY, TO ELIMINATE THE FRACTION, MULTIPLY BOTH NUMERATOR AND DENOMINATOR OF THE DIVISOR BY 4:

$$\left[\text{DIVISOR: } \frac{3}{4} \times 4 = 3 \times 1 = 3 \right]$$

SIMILARLY, YOU MUST MULTIPLY THE DIVIDEND BY 4 AS WELL:

$$\left[\text{DIVIDEND: } 48 \times 4 = 192 \right]$$

STEP 4: PERFORM THE ADJUSTED DIVISION

NOW, DIVIDE THE ADJUSTED DIVIDEND BY THE ADJUSTED DIVISOR:

$$\left[192 \div 3 = 64 \right]$$

ANSWER: $48 \div 0.75 = 64$

PRACTICAL EXAMPLES AND DETAILED EXPLANATIONS

TO DEEPEN UNDERSTANDING, LET'S ANALYZE VARIOUS SCENARIOS WITH DETAILED STEPS.

EXAMPLE 1: DIVIDING BY A FRACTION

PROBLEM: DIVIDE 35 BY $\frac{5}{8}$.

STEP 1: RECOGNIZE THE DIVISOR AS A FRACTION.

STEP 2: FIND THE RECIPROCAL OF $\frac{5}{8}$, WHICH IS $\frac{8}{5}$.

STEP 3: CONVERT THE DIVISION INTO MULTIPLICATION:

$$[35 \div \frac{5}{8} = 35 \times \frac{8}{5}]$$

STEP 4: SIMPLIFY THE MULTIPLICATION:

- MULTIPLY 35 BY 8:

$$[35 \times 8 = 280]$$

- DIVIDE BY 5:

$$[280 \div 5 = 56]$$

RESULT: $35 \div \frac{5}{8} = 56$

NOTE: ALTERNATIVELY, YOU COULD MULTIPLY NUMERATOR AND DENOMINATOR TO ELIMINATE THE FRACTION:

- MULTIPLY NUMERATOR AND DENOMINATOR OF THE DIVISOR BY 8:

$$[\frac{5}{8} \times 8 = 5]$$

$$[\text{DIVIDEND: } 35 \times 8 = 280]$$

- THEN DIVIDE:

$$[280 \div 5 = 56]$$

EXAMPLE 2: DIVIDING BY A DECIMAL

PROBLEM: DIVIDE 48.6 BY 0.3.

STEP 1: EXPRESS 0.3 AS A FRACTION:

$$[0.3 = \frac{3}{10}]$$

STEP 2: FIND THE RECIPROCAL OF $\frac{3}{10}$, WHICH IS $\frac{10}{3}$.

STEP 3: CONVERT THE DIVISION INTO MULTIPLICATION:

$$\left[48.6 \div \frac{3}{10} = 48.6 \times \frac{10}{3} \right]$$

STEP 4: SIMPLIFY:

- MULTIPLY 48.6 BY 10:

$$\left[48.6 \times 10 = 486 \right]$$

- DIVIDE BY 3:

$$\left[486 \div 3 = 162 \right]$$

$$\text{ANSWER: } 48.6 \div 0.3 = 162$$

ALTERNATIVE METHOD: TO AVOID DEALING WITH FRACTIONS, MULTIPLY BOTH NUMBERS BY 10 TO ELIMINATE THE DECIMAL:

$$\left[48.6 \times 10 = 486 \right]$$

$$\left[0.3 \times 10 = 3 \right]$$

THEN:

$$\left[486 \div 3 = 162 \right]$$

THIS METHOD OFTEN SIMPLIFIES CALCULATIONS BY REMOVING DECIMALS UPFRONT.

HANDLING MORE COMPLEX DIVISORS: MULTIPLE STEPS FOR TRANSFORMATION

SOME DIVISORS INVOLVE MORE CHALLENGING FRACTIONS OR DECIMALS, REQUIRING MULTIPLE STEPS TO TRANSFORM INTO WHOLE NUMBERS.

WHEN TO USE LEAST COMMON MULTIPLE (LCM)

IF THE DIVISOR INVOLVES MULTIPLE FRACTIONAL COMPONENTS, FINDING THE LCM OF DENOMINATORS CAN HELP IDENTIFY A COMMON MULTIPLIER THAT CLEARS ALL FRACTIONS SIMULTANEOUSLY.

EXAMPLE: DIVIDE 60 BY $\frac{1}{3} + \frac{1}{4}$.

STEP 1: FIND COMMON DENOMINATOR OF 3 AND 4, WHICH IS 12.

STEP 2: REWRITE THE SUM:

$$\left[\frac{1}{3} = \frac{4}{12} \right]$$

$$\left[\frac{1}{4} = \frac{3}{12} \right]$$

$$\left[\text{SUM} = \frac{4}{12} + \frac{3}{12} = \frac{7}{12} \right]$$

STEP 3: EXPRESS DIVIDING BY THIS SUM:

$$\left[60 \div \frac{7}{12} \right]$$

STEP 4: MULTIPLY 60 BY THE RECIPROCAL:

$$\left[60 \times \frac{12}{7} = \frac{60 \times 12}{7} = \frac{720}{7} \approx 102.857 \right]$$

TO MAKE THE DIVISOR A WHOLE NUMBER, MULTIPLY NUMERATOR AND DENOMINATOR BY 7:

$$\begin{aligned} & \text{[\text{ADJUSTED DIVIDEND: } } 60 \times 7 = 420 \text{]} \\ & \text{[\text{ADJUSTED DIVISOR: } } \frac{7}{12} \times 7 = \frac{49}{12} \text{]} \end{aligned}$$

BUT THIS INTRODUCES A FRACTIONAL DIVISOR AGAIN. ALTERNATIVELY, MULTIPLY BOTH THE DIVIDEND AND THE DIVISOR BY 12:

$$\begin{aligned} & [60 \times 12 = 720] \\ & [\frac{7}{12} \times 12 = 7] \end{aligned}$$

NOW, THE DIVISION SIMPLIFIES TO:

$$[720 \div 7]$$

WHICH IS EASIER TO HANDLE.

ADDITIONAL TIPS AND BEST PRACTICES

- ALWAYS SIMPLIFY FRACTIONS BEFORE PERFORMING MULTIPLICATIONS TO AVOID UNNECESSARY COMPLICATIONS.
- USE EQUIVALENT FRACTIONS OR DECIMALS TO EXPRESS DIVISORS IN A FORM THAT MAKES FINDING THE MULTIPLIER STRAIGHTFORWARD.
- LEVERAGE PRIME FACTORIZATION WHEN DEALING WITH LARGE NUMBERS TO IDENTIFY THE LEAST COMMON MULTIPLE EFFICIENTLY.
- DOUBLE-CHECK YOUR WORK BY DIVIDING THE ORIGINAL DIVIDEND BY THE TRANSFORMED DIVISOR TO VERIFY THE RESULT.

CONCLUSION: THE POWER OF TRANSFORMATION IN DIVISION

TRANSFORMING A DIVISOR INTO A WHOLE NUMBER THROUGH MULTIPLICATION IS A POWERFUL TECHNIQUE THAT SIMPLIFIES COMPLEX DIVISION PROBLEMS, ENHANCES ACCURACY, AND ALIGNS CALCULATIONS WITH CONVENTIONAL METHODS LIKE LONG DIVISION. BY UNDERSTANDING THE PROPERTIES OF FRACTIONS AND DECIMALS, AND APPLYING STRATEGIC MULTIPLICATIONS, YOU CAN CONVERT CHALLENGING DIVISORS INTO MANAGEABLE, WHOLE NUMBERS WITH CONFIDENCE.

IN PRACTICE, ALWAYS START BY EXPRESSING THE DIVISOR IN THE SIMPLEST FORM—BE IT A FRACTION OR DECIMAL—AND THEN DETERMINE THE APPROPRIATE MULTIPLIER TO CLEAR THE FRACTIONS OR

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