

SOLVE $1.25 \times 4 + 3 \times 2$ DIVIDED BY $(1/2)$ TO THE 3RD POWER

SOLVE $1.25 \times 4 + 3 \times 2$ DIVIDED BY $(1/2)$ TO THE 3RD POWER IS A MATHEMATICAL EXPRESSION THAT INVOLVES MULTIPLE OPERATIONS, INCLUDING MULTIPLICATION, ADDITION, DIVISION, AND EXPONENTS. UNDERSTANDING HOW TO APPROACH SUCH AN EXPRESSION IS ESSENTIAL FOR MASTERING ORDER OF OPERATIONS, OFTEN REMEMBERED BY THE ACRONYM PEMDAS (PARENTHESES, EXPONENTS, MULTIPLICATION AND DIVISION, ADDITION AND SUBTRACTION). IN THIS ARTICLE, WE WILL BREAK DOWN THE EXPRESSION STEP-BY-STEP, EXPLORE THE UNDERLYING MATHEMATICAL PRINCIPLES, AND PROVIDE TIPS TO SOLVE SIMILAR PROBLEMS EFFICIENTLY.

UNDERSTANDING THE COMPONENTS OF THE EXPRESSION

BEFORE DIVING INTO CALCULATIONS, IT'S IMPORTANT TO IDENTIFY EACH PART OF THE EXPRESSION:

- 1.25×4
- 3×2
- $(1/2)$ TO THE 3RD POWER

THE EXPRESSION, WHEN WRITTEN OUT, LOOKS LIKE THIS:

$$1.25 \times 4 + 3 \times 2 \div (1/2)^3$$

NOTICE THE PRESENCE OF PARENTHESES AROUND $(1/2)$, INDICATING THAT THE EXPONENT APPLIES TO THE ENTIRE FRACTION.

STEP-BY-STEP BREAKDOWN OF THE CALCULATION

TO ACCURATELY SOLVE THE EXPRESSION, FOLLOW THE ORDER OF OPERATIONS:

1. PARENTHESES AND EXPONENTS
2. MULTIPLICATION AND DIVISION (FROM LEFT TO RIGHT)
3. ADDITION AND SUBTRACTION (FROM LEFT TO RIGHT)

LET'S ANALYZE EACH STEP CAREFULLY.

STEP 1: CALCULATE THE EXPONENT $(1/2)^3$

THE FIRST STEP IS TO EVALUATE THE EXPONENTIATION INVOLVING THE FRACTION:

$$(1/2)^3$$

RECALL THAT RAISING A FRACTION TO A POWER INVOLVES RAISING BOTH NUMERATOR AND DENOMINATOR TO THAT POWER:

$$(1/2)^3 = 1^3 / 2^3 = 1 / 8$$

THIS SIMPLIFIES THE EXPRESSION TO:

$$1.25 \times 4 + 3 \times 2 \div (1/8)$$

STEP 2: SIMPLIFY MULTIPLICATION AND DIVISION FROM LEFT TO RIGHT

NEXT, PERFORM THE MULTIPLICATION AND DIVISION OPERATIONS AS THEY APPEAR FROM LEFT TO RIGHT.

- FIRST, CALCULATE 1.25×4 :

$$1.25 \times 4 = 5$$

- NEXT, CALCULATE 3×2 :

$$3 \times 2 = 6$$

- THEN, PERFORM THE DIVISION $6 \div (1/8)$:

DIVIDING BY A FRACTION IS EQUIVALENT TO MULTIPLYING BY ITS RECIPROCAL:

$$6 \div (1/8) = 6 \times 8 = 48$$

NOW, THE EXPRESSION SIMPLIFIES TO:

$$5 + 48$$

STEP 3: FINAL ADDITION

ADD THE REMAINING TERMS:

$$5 + 48 = 53$$

FINAL ANSWER: 53

SUMMARY OF THE CALCULATION PROCESS

TO SUMMARIZE, HERE ARE THE KEY STEPS INVOLVED IN SOLVING THE EXPRESSION:

- CALCULATE THE EXPONENT $(1/2)^3 = 1/8$
- MULTIPLY 1.25 BY 4 TO GET 5
- MULTIPLY 3 BY 2 TO GET 6
- DIVIDE 6 BY $1/8$, WHICH EQUALS $6 \times 8 = 48$
- ADD 5 AND 48 TO GET 53

THIS SYSTEMATIC APPROACH ENSURES CLARITY AND ACCURACY IN SOLVING COMPLEX EXPRESSIONS.

TIPS FOR SOLVING SIMILAR EXPRESSIONS

MASTERING THE ORDER OF OPERATIONS IS CRUCIAL IN MATHEMATICS. HERE ARE SOME TIPS TO HELP YOU TACKLE SIMILAR

PROBLEMS:

1. ALWAYS FOLLOW THE PEMDAS RULE

REMEMBER THE SEQUENCE:

- PARENTHESES
- EXPONENTS
- MULTIPLICATION AND DIVISION (LEFT TO RIGHT)
- ADDITION AND SUBTRACTION (LEFT TO RIGHT)

2. SIMPLIFY COMPLEX PARTS STEP-BY-STEP

BREAK DOWN COMPLICATED EXPRESSIONS INTO MANAGEABLE PARTS, SOLVING EACH BEFORE MOVING ON.

3. HANDLE EXPONENTS CAREFULLY, ESPECIALLY WITH FRACTIONS

RECOGNIZE THAT FRACTIONAL EXPONENTS CAN BE REWRITTEN AS ROOTS OR POWERS, MAKING CALCULATIONS EASIER.

4. CONVERT DIVISION INVOLVING FRACTIONS INTO MULTIPLICATION

DIVIDING BY A FRACTION IS THE SAME AS MULTIPLYING BY ITS RECIPROCAL; THIS IS A COMMON PITFALL TO AVOID.

5. USE PARENTHESES LIBERALLY IN YOUR CALCULATIONS

PARENTHESES CLARIFY THE ORDER OF OPERATIONS, ESPECIALLY WHEN DEALING WITH EXPONENTS OR MULTIPLE OPERATIONS.

COMMON MISTAKES TO AVOID

WHILE SOLVING SUCH EXPRESSIONS, BE MINDFUL OF THESE PITFALLS:

- IGNORING THE ORDER OF OPERATIONS
- MISCOMPUTING EXPONENTS, ESPECIALLY WITH FRACTIONS
- FORGETTING THAT DIVISION BY A FRACTION IS MULTIPLICATION BY ITS RECIPROCAL
- MIXING UP THE SEQUENCE OF OPERATIONS, LEADING TO INCORRECT RESULTS

BEING AWARE OF THESE MISTAKES CAN IMPROVE YOUR ACCURACY AND CONFIDENCE IN SOLVING MATH PROBLEMS.

APPLICATIONS OF SUCH MATHEMATICAL EXPRESSIONS

UNDERSTANDING HOW TO EVALUATE COMPLEX EXPRESSIONS LIKE *SOLVE $1.25 \times 4 + 3 \times 2$ DIVIDED BY $(1/2)$ TO THE 3RD POWER* HAS PRACTICAL APPLICATIONS:

- FINANCIAL CALCULATIONS: COMPUTING INTEREST RATES, DISCOUNTS, OR INVESTMENT RETURNS INVOLVING MULTIPLE OPERATIONS.
- ENGINEERING: ANALYZING FORMULAS WITH MULTIPLE VARIABLES AND OPERATIONS.
- PROGRAMMING: WRITING ALGORITHMS THAT EVALUATE EXPRESSIONS DYNAMICALLY.
- EDUCATION: BUILDING A STRONG FOUNDATION IN MATHEMATICAL REASONING AND PROBLEM-SOLVING SKILLS.

CONCLUSION

SOLVING THE EXPRESSION $1.25 \times 4 + 3 \times 2 \div (1/2)^3$ REQUIRES A CLEAR UNDERSTANDING OF THE ORDER OF OPERATIONS, CAREFUL HANDLING OF EXPONENTS, AND KNOWLEDGE OF HOW TO MANIPULATE FRACTIONS. BY FOLLOWING A SYSTEMATIC APPROACH—CALCULATING EXPONENTS FIRST, THEN PERFORMING MULTIPLICATION AND DIVISION FROM LEFT TO RIGHT, AND FINALLY COMPLETING ADDITION—YOU ARRIVE AT THE CORRECT ANSWER.

REMEMBER, PRACTICE MAKES PERFECT. REGULARLY WORKING THROUGH SIMILAR PROBLEMS WILL IMPROVE YOUR PROFICIENCY AND CONFIDENCE IN TACKLING COMPLEX MATHEMATICAL EXPRESSIONS. WHETHER YOU'RE A STUDENT, A PROFESSIONAL, OR JUST SOMEONE LOOKING TO SHARPEN YOUR MATH SKILLS, MASTERING THESE FUNDAMENTAL CONCEPTS IS INVALUABLE FOR EVERYDAY PROBLEM-SOLVING AND ADVANCED MATHEMATICAL REASONING ALIKE.

FINAL NOTE: ALWAYS DOUBLE-CHECK YOUR WORK AND ENSURE THAT EACH STEP ALIGNS WITH THE ORDER OF OPERATIONS. WITH PRACTICE, SOLVING EXPRESSIONS LIKE THIS WILL BECOME SECOND NATURE!

FREQUENTLY ASKED QUESTIONS

HOW DO I CORRECTLY EVALUATE THE EXPRESSION $1.25 \times 4 + 3 \times 2$ DIVIDED BY $(1/2)$ RAISED TO THE POWER OF 3?

FIRST, CALCULATE EACH PART STEP-BY-STEP: $1.25 \times 4 = 5$, AND $3 \times 2 = 6$. THEN, COMPUTE $(1/2)^3 = (1/2) \times (1/2) \times (1/2) = 1/8$. NEXT, ADD $5 + 6 = 11$. FINALLY, DIVIDE 11 BY $1/8$, WHICH IS EQUIVALENT TO MULTIPLYING 11 BY 8, RESULTING IN 88.

WHAT IS THE VALUE OF THE EXPRESSION $1.25 \times 4 + 3 \times 2 / (1/2)^3$?

THE VALUE OF THE EXPRESSION IS 88. BREAKING IT DOWN: $1.25 \times 4 = 5$, $3 \times 2 = 6$, $(1/2)^3 = 1/8$. SO, $5 + 6 = 11$, AND DIVIDING 11 BY $1/8$ IS $11 \times 8 = 88$.

CAN YOU EXPLAIN THE ORDER OF OPERATIONS FOR SOLVING $1.25 \times 4 + 3 \times 2$ DIVIDED BY $(1/2)^3$?

YES. FOLLOW PEMDAS: FIRST EVALUATE EXPONENTS, SO $(1/2)^3 = 1/8$. THEN, PERFORM MULTIPLICATION: $1.25 \times 4 = 5$ AND $3 \times 2 = 6$. NEXT, ADD $5 + 6 = 11$. FINALLY, DIVIDE 11 BY $1/8$, WHICH IS THE SAME AS MULTIPLYING 11 BY 8, GIVING 88.

WHAT IS THE STEP-BY-STEP SOLUTION TO THE EXPRESSION $1.25 \times 4 + 3 \times 2 / (1/2)^3$?

STEP 1: CALCULATE $1.25 \times 4 = 5$. STEP 2: CALCULATE $3 \times 2 = 6$. STEP 3: COMPUTE $(1/2)^3 = 1/8$. STEP 4: ADD THE

RESULTS FROM STEPS 1 AND 2: $5 + 6 = 11$. STEP 5: DIVIDE 11 BY $1/8$, WHICH EQUALS $11 \times 8 = 88$. THE FINAL ANSWER IS 88.

IS THERE A SHORTCUT TO SOLVING $1.25 \times 4 + 3 \times 2 \div (1/2)^3$?

YES. RECOGNIZE THAT DIVIDING BY $(1/2)^3$ IS THE SAME AS MULTIPLYING BY 8, SINCE $(1/2)^3 = 1/8$. SO, FIRST PERFORM THE MULTIPLICATIONS TO GET 5 AND 6, ADD TO GET 11, THEN MULTIPLY BY 8 TO GET THE FINAL ANSWER, 88.

WHAT COMMON MISTAKES SHOULD I AVOID WHEN SOLVING THIS EXPRESSION?

AVOID FORGETTING TO EVALUATE EXPONENTS BEFORE MULTIPLICATION AND ADDITION, AND REMEMBER THAT DIVIDING BY A FRACTIONAL POWER IS EQUIVALENT TO MULTIPLYING BY ITS RECIPROCAL. ALSO, ENSURE PROPER ORDER OF OPERATIONS IS FOLLOWED TO PREVENT CALCULATION ERRORS.

HOW CAN I VERIFY THAT THE ANSWER 88 IS CORRECT FOR THIS EXPRESSION?

YOU CAN VERIFY BY BREAKING DOWN THE CALCULATION STEP-BY-STEP AS SHOWN: EVALUATE THE EXPONENTIAL, PERFORM MULTIPLICATIONS, ADD, THEN DIVIDE OR MULTIPLY ACCORDINGLY. RECHECKING EACH STEP ENSURES THE CORRECTNESS, CONFIRMING THE FINAL ANSWER IS 88.

ADDITIONAL RESOURCES

SOLVE $1.25 \times 4 + 3 \times 2$ DIVIDED BY $(1/2)$ TO THE 3RD POWER: AN IN-DEPTH MATHEMATICAL ANALYSIS AND BREAKDOWN

INTRODUCTION

MATHEMATICS OFTEN APPEARS AS A COMPLEX WEB OF NUMBERS AND OPERATIONS, BUT AT ITS CORE, IT IS A SYSTEMATIC LANGUAGE THAT ALLOWS US TO INTERPRET AND MANIPULATE THE WORLD AROUND US. AMONG THE FUNDAMENTAL SKILLS IN MATH IS THE ABILITY TO INTERPRET AND EVALUATE EXPRESSIONS ACCURATELY, ESPECIALLY THOSE INVOLVING MULTIPLE OPERATIONS SUCH AS MULTIPLICATION, DIVISION, ADDITION, AND EXPONENTS. ONE SUCH EXPRESSION THAT EXEMPLIFIES THESE CONCEPTS IS:

SOLVE $1.25 \times 4 + 3 \times 2 \div (1/2)^3$

THIS SEEMINGLY STRAIGHTFORWARD PROBLEM OFFERS A RICH OPPORTUNITY TO EXPLORE THE ORDER OF OPERATIONS, THE HANDLING OF FRACTIONAL EXPONENTS, AND THE IMPORTANCE OF CLEAR MATHEMATICAL REASONING. IN THIS COMPREHENSIVE REVIEW, WE WILL DISSECT THE PROBLEM STEP-BY-STEP, ANALYZE THE REASONING BEHIND EACH STEP, AND DISCUSS THE BROADER IMPLICATIONS OF MASTERING SUCH CALCULATIONS.

UNDERSTANDING THE EXPRESSION

BEFORE DIVING INTO CALCULATIONS, IT IS ESSENTIAL TO UNDERSTAND THE STRUCTURE AND COMPONENTS OF THE EXPRESSION:

EXPRESSION: $1.25 \times 4 + 3 \times 2 \div (1/2)^3$

BREAKING IT DOWN:

- MULTIPLICATION COMPONENTS: 1.25×4 AND 3×2
- DIVISION COMPONENT: THE ENTIRE DIVISION BY $(1/2)^3$
- EXPONENT COMPONENT: $(1/2)$ RAISED TO THE THIRD POWER

THE KEY CHALLENGES INCLUDE CORRECTLY APPLYING THE ORDER OF OPERATIONS (PEMDAS/BODMAS), PROPERLY HANDLING FRACTIONAL EXPONENTS, AND ENSURING CLARITY IN EACH CALCULATION STEP.

THE IMPORTANCE OF ORDER OF OPERATIONS

THE MATHEMATICAL OPERATIONS IN THE EXPRESSION FOLLOW THE HIERARCHY SPECIFIED BY THE ORDER OF OPERATIONS:

1. PARENTHESES: OPERATIONS INSIDE PARENTHESES ARE PERFORMED FIRST.
2. EXPONENTS: POWERS AND ROOTS ARE EVALUATED NEXT.
3. MULTIPLICATION AND DIVISION: HANDLED FROM LEFT TO RIGHT.
4. ADDITION AND SUBTRACTION: HANDLED LAST, ALSO FROM LEFT TO RIGHT.

APPLYING THESE RULES ENSURES UNAMBIGUOUS AND CONSISTENT RESULTS ACROSS DIFFERENT CALCULATIONS AND CONTEXTS.

STEP-BY-STEP SOLUTION

1. CALCULATE THE EXPONENT: $(1/2)^3$

THE BASE HERE IS A FRACTION, $1/2$, RAISED TO THE THIRD POWER:

$$-(1/2)^3 = (1/2) \times (1/2) \times (1/2)$$

CALCULATING:

- FIRST MULTIPLICATION: $(1/2) \times (1/2) = 1/4$
- SECOND MULTIPLICATION: $(1/4) \times (1/2) = 1/8$

$$\text{RESULT: } (1/2)^3 = 1/8$$

2. REWRITE THE EXPRESSION WITH THE EXPONENT EVALUATED:

$$\text{EXPRESSION NOW: } 1.25 \times 4 + 3 \times 2 \div 1/8$$

3. SIMPLIFY MULTIPLICATION AND DIVISION FROM LEFT TO RIGHT.

- A. CALCULATE 1.25×4

$$- 1.25 \times 4 = (1 + 0.25) \times 4 = 4 + 1 = 5$$

- B. CALCULATE 3×2

$$- 3 \times 2 = 6$$

- C. ADDRESS DIVISION: $6 \div 1/8$

DIVIDING BY A FRACTION IS EQUIVALENT TO MULTIPLYING BY ITS RECIPROCAL:

$$- 6 \div 1/8 = 6 \times 8 = 48$$

4. ASSEMBLE THE SIMPLIFIED EXPRESSION:

EXPRESSION BECOMES: $5 + 48$

FINAL CALCULATION:

$$- 5 + 48 = 53$$

FINAL RESULT

THE VALUE OF THE EXPRESSION $1.25 \times 4 + 3 \times 2 \div (1/2)^3$ IS 53.

BROADER CONTEXT AND IMPLICATIONS

MATHEMATICAL PRECISION AND ITS REAL-WORLD APPLICATIONS

THIS PROBLEM EXEMPLIFIES HOW PRECISE UNDERSTANDING OF OPERATIONS AND HIERARCHIES IS CRITICAL IN FIELDS RANGING FROM ENGINEERING TO FINANCE. A SMALL MISINTERPRETATION—SUCH AS NEGLECTING THE ORDER OF OPERATIONS OR MISHANDLING EXPONENTS—CAN LEAD TO SIGNIFICANT ERRORS IN CALCULATIONS, WHICH IN TURN CAN HAVE SERIOUS CONSEQUENCES IN PRACTICAL SCENARIOS.

HANDLING FRACTIONS AND EXPONENTS

THE FRACTIONAL EXPONENT $(1/2)^3$ IS A COMMON STUMBLING BLOCK FOR STUDENTS AND PRACTITIONERS ALIKE. IT SERVES AS A GATEWAY TO UNDERSTANDING MORE COMPLEX ROOTS AND POWERS. RECOGNIZING THAT:

$$- (A/B)^N = A^N / B^N$$

AND THAT:

$$- (A/B)^3 = A^3 / B^3$$

IS FUNDAMENTAL IN SIMPLIFYING AND EVALUATING EXPRESSIONS INVOLVING FRACTIONAL EXPONENTS.

IN THIS CASE, UNDERSTANDING THAT $(1/2)^3 = 1/8$ HELPS CLARIFY THE DIVISION STEP AND ENSURES ACCURATE COMPUTATION.

EDUCATIONAL TAKEAWAYS

- ORDER OF OPERATIONS: MASTERY OF PEMDAS/BODMAS IS NON-NEGOTIABLE FOR ACCURATE CALCULATIONS.
- FRACTIONAL EXPONENTS: RECOGNIZING THE MEANING OF FRACTIONAL POWERS ENHANCES ALGEBRAIC FLUENCY.
- DIVISION OF FRACTIONS: REMEMBERING THAT DIVIDING BY A FRACTION EQUALS MULTIPLYING BY ITS RECIPROCAL SIMPLIFIES COMPLEX EXPRESSIONS.
- STEPWISE APPROACH: BREAKING DOWN COMPLEX EXPRESSIONS INTO MANAGEABLE STEPS MINIMIZES ERRORS AND IMPROVES COMPREHENSION.

ADVANCED PERSPECTIVES

WHILE THIS CALCULATION IS STRAIGHTFORWARD, IT OPENS AVENUES INTO MORE ADVANCED TOPICS:

- RADICAL EXPRESSIONS: UNDERSTANDING HOW FRACTIONAL EXPONENTS RELATE TO ROOTS.
- ALGEBRAIC MANIPULATION: SIMPLIFYING MORE COMPLEX EXPRESSIONS INVOLVING MULTIPLE LAYERS OF FRACTIONAL POWERS

AND NESTED PARENTHESES.

- COMPUTATIONAL TOOLS: USING CALCULATORS AND SOFTWARE TO VERIFY MANUAL CALCULATIONS, ESPECIALLY IN HIGH-STAKES CONTEXTS.

CONCLUSION

THE PROBLEM SOLVE $1.25 \times 4 + 3 \times 2 \div (1/2)^3$ IS MORE THAN JUST A SIMPLE ARITHMETIC EXERCISE; IT IS A CONDUIT FOR UNDERSTANDING FUNDAMENTAL PRINCIPLES OF MATHEMATICS. BY METICULOUSLY APPLYING THE ORDER OF OPERATIONS, CORRECTLY HANDLING EXPONENTS, AND RECOGNIZING THE PROPERTIES OF FRACTIONS, WE ARRIVE AT THE RESULT OF 53. SUCH PROBLEMS UNDERSCORE THE IMPORTANCE OF PRECISION, CLARITY, AND METHODICAL REASONING—SKILLS THAT ARE VITAL ACROSS SCIENTIFIC, ENGINEERING, FINANCIAL, AND TECHNOLOGICAL DOMAINS.

MASTERING THESE CONCEPTS EQUIPS LEARNERS AND PROFESSIONALS ALIKE WITH THE TOOLS NECESSARY TO TACKLE INCREASINGLY COMPLEX MATHEMATICAL CHALLENGES, FOSTERING CRITICAL THINKING AND ANALYTICAL SKILLS ESSENTIAL IN TODAY'S DATA-DRIVEN WORLD.

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