

SOLVE, SHOWING AND EXPLAINING ALL STEPS IN THE PROCESS. $7x - 9 - 4(x - 1) = 28$

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WHEN IT COMES TO SOLVING ALGEBRAIC EQUATIONS, UNDERSTANDING EACH STEP CLEARLY IS ESSENTIAL FOR MASTERING THE SKILL. TODAY, WE WILL WALK THROUGH THE PROCESS OF SOLVING THE EQUATION $7x - 9 - 4(x - 1) = 28$. OUR GOAL IS TO FIND THE VALUE OF x BY SYSTEMATICALLY SIMPLIFYING AND ISOLATING THE VARIABLE. WHETHER YOU'RE A STUDENT, TEACHER, OR SOMEONE INTERESTED IN SHARPENING YOUR ALGEBRA SKILLS, THIS DETAILED EXPLANATION WILL HELP YOU UNDERSTAND HOW TO APPROACH SIMILAR PROBLEMS WITH CONFIDENCE.

UNDERSTANDING THE EQUATION

BEFORE DIVING INTO SOLVING, IT'S IMPORTANT TO UNDERSTAND THE STRUCTURE OF THE EQUATION:

$$7x - 9 - 4(x - 1) = 28$$

THIS IS A LINEAR ALGEBRAIC EQUATION INVOLVING A VARIABLE (x) AND CONSTANTS. THE KEY STEPS INVOLVE:

- DISTRIBUTING ANY FACTORS ACROSS PARENTHESES
- COMBINING LIKE TERMS
- ISOLATING THE VARIABLE TO ONE SIDE

LET'S START BY BREAKING DOWN EACH COMPONENT.

STEP 1: DISTRIBUTE AND EXPAND THE EQUATION

THE FIRST STEP IS TO REMOVE PARENTHESES BY DISTRIBUTING ANY FACTORS:

$$-4(x - 1) \text{ EXPANDS AS } -4x + -4(-1)$$

WHICH SIMPLIFIES TO:

$$-4x + 4$$

SO, REWRITING THE ORIGINAL EQUATION:

$$7x - 9 - 4x + 4 = 28$$

NOTE: IT'S ESSENTIAL TO REMEMBER THAT SUBTRACTING A NEGATIVE IS EQUIVALENT TO ADDITION, WHICH IS WHY $-4(-1) = +4$.

STEP 2: COMBINE LIKE TERMS

NEXT, COMBINE THE TERMS WITH X AND THE CONSTANTS:

- COMBINE $7x$ AND $-4x$:

$$7x - 4x = 3x$$

- COMBINE -9 AND $+4$:

$$-9 + 4 = -5$$

NOW, THE SIMPLIFIED FORM OF THE EQUATION IS:

$$3x - 5 = 28$$

STEP 3: ISOLATE THE VARIABLE TERM

TO SOLVE FOR x , WE NEED TO GET $3x$ ALONE ON ONE SIDE:

ADD 5 TO BOTH SIDES TO MOVE CONSTANTS TO THE RIGHT:

$$3x - 5 + 5 = 28 + 5$$

WHICH SIMPLIFIES TO:

$$3x = 33$$

STEP 4: SOLVE FOR X

NOW, DIVIDE BOTH SIDES BY 3 TO ISOLATE X:

$$(3x) / 3 = 33 / 3$$

WHICH RESULTS IN:

$$x = 11$$

FINAL ANSWER

THE SOLUTION TO THE EQUATION $7x - 9 - 4(x - 1) = 28$ IS:

$$x = 11$$

SUMMARY OF STEPS IN SOLVING THE EQUATION

HERE'S A QUICK RECAP OF THE PROCESS:

1. DISTRIBUTE: EXPAND $-4(x - 1)$ TO $-4x + 4$.
2. COMBINE LIKE TERMS: SIMPLIFY THE X TERMS AND CONSTANTS.
3. ISOLATE THE VARIABLE TERM: ADD OR SUBTRACT CONSTANTS TO BOTH

SIDES.

4. SOLVE FOR THE VARIABLE: DIVIDE BOTH SIDES BY THE COEFFICIENT OF X.

ADDITIONAL TIPS FOR SOLVING SIMILAR EQUATIONS

TO EXCEL AT SOLVING ALGEBRAIC EQUATIONS LIKE THIS, KEEP THESE TIPS IN MIND:

- ALWAYS PERFORM THE SAME OPERATION ON BOTH SIDES OF THE EQUATION TO MAINTAIN EQUALITY.
- DISTRIBUTE BEFORE COMBINING LIKE TERMS.
- BE CAUTIOUS WITH NEGATIVE SIGNS, ESPECIALLY WHEN DISTRIBUTING OR MOVING TERMS.
- SIMPLIFY STEP-BY-STEP; DON'T RUSH THROUGH THE PROCESS.
- CHECK YOUR SOLUTION BY SUBSTITUTING THE VALUE BACK INTO THE ORIGINAL EQUATION.

PRACTICE PROBLEMS FOR MASTERY

TO REINFORCE YOUR UNDERSTANDING, TRY SOLVING THESE SIMILAR EQUATIONS:

1. $5x + 3 - 2(x + 4) = 7$
2. $2(3x - 1) + 4 = 10$
3. $-3x + 6 = 2x - 4$
4. $4(x - 2) = 3x + 2$

WORK THROUGH EACH CAREFULLY, FOLLOWING THE SAME STEPS OUTLINED IN THIS ARTICLE.

CONCLUSION

SOLVING LINEAR EQUATIONS SUCH AS $7x - 9 - 4(x - 1) = 28$ INVOLVES A SYSTEMATIC APPROACH: DISTRIBUTING, COMBINING LIKE TERMS, ISOLATING THE VARIABLE, AND PERFORMING INVERSE OPERATIONS. BY UNDERSTANDING EACH STEP AND PRACTICING REGULARLY, YOU'LL DEVELOP CONFIDENCE AND PROFICIENCY IN ALGEBRA. REMEMBER, MASTERY COMES FROM PRACTICE AND PAYING ATTENTION TO EVERY DETAIL IN EACH STEP. KEEP WORKING THROUGH SIMILAR PROBLEMS, AND YOU'LL ENHANCE YOUR PROBLEM-SOLVING SKILLS SIGNIFICANTLY!

FREQUENTLY ASKED QUESTIONS

WHAT IS THE FIRST STEP TO SOLVE THE EQUATION $7x - 9 - 4(x - 1) = 28$?

THE FIRST STEP IS TO DISTRIBUTE THE -4 ACROSS $(x - 1)$, SO REWRITE THE EQUATION AS $7x - 9 - 4x + 4 = 28$.

HOW DO WE SIMPLIFY THE EQUATION AFTER DISTRIBUTING THE -4 ?

COMBINE LIKE TERMS: $7x - 4x$ GIVES $3x$, AND $-9 + 4$ GIVES -5 . SO, THE EQUATION BECOMES $3x - 5 = 28$.

WHAT IS THE NEXT STEP AFTER SIMPLIFYING TO $3x - 5 = 28$?

ADD 5 TO BOTH SIDES TO ISOLATE THE TERM WITH x : $3x = 28 + 5$.

WHAT IS THE RESULT OF ADDING 5 TO BOTH SIDES?

$$3x = 33.$$

HOW DO WE SOLVE FOR x ONCE WE HAVE $3x = 33$?

DIVIDE BOTH SIDES BY 3 TO FIND x : $x = 33 \div 3$.

WHAT IS THE VALUE OF x AFTER DIVIDING BOTH SIDES BY 3?

$$x = 11.$$

HOW CAN WE CHECK IF OUR SOLUTION $x = 11$ IS CORRECT?

SUBSTITUTE $x = 11$ BACK INTO THE ORIGINAL EQUATION AND VERIFY IF BOTH SIDES ARE EQUAL.

WHAT IS THE VERIFICATION PROCESS FOR $x = 11$ IN THE ORIGINAL EQUATION?

CALCULATE $7(11) - 9 - 4(11 - 1)$: $77 - 9 - 4(10) = 77 - 9 - 40 = 28$, WHICH MATCHES THE RIGHT SIDE, CONFIRMING THE SOLUTION IS CORRECT.

WHY IS IT IMPORTANT TO SHOW ALL STEPS WHEN SOLVING EQUATIONS LIKE $7x - 9 - 4(x - 1) = 28$?

SHOWING ALL STEPS ENSURES CLARITY, HELPS PREVENT ERRORS, AND DEMONSTRATES UNDERSTANDING OF THE SOLVING PROCESS FOR EDUCATIONAL PURPOSES.

ADDITIONAL RESOURCES

SOLVE, SHOWING AND EXPLAINING ALL STEPS IN THE PROCESS. $7x - 9 - 4(x - 1) = 28$

WHEN TACKLING ALGEBRAIC EQUATIONS SUCH AS "SOLVE, SHOWING AND EXPLAINING ALL STEPS IN THE PROCESS. $7x - 9 - 4(x - 1) = 28$ ", IT'S ESSENTIAL TO APPROACH THEM SYSTEMATICALLY. BREAKING DOWN EACH STEP NOT ONLY HELPS IN ARRIVING AT THE CORRECT SOLUTION BUT ALSO REINFORCES UNDERSTANDING OF FUNDAMENTAL ALGEBRAIC PRINCIPLES. IN THIS GUIDE, WE WILL THOROUGHLY ANALYZE AND SOLVE THIS EQUATION, ILLUSTRATING EVERY STEP WITH CLEAR EXPLANATIONS, SO YOU CAN CONFIDENTLY HANDLE SIMILAR PROBLEMS IN THE FUTURE.

UNDERSTANDING THE EQUATION

BEFORE DIVING INTO THE SOLUTION, LET'S EXAMINE THE GIVEN EQUATION:

$$7x - 9 - 4(x - 1) = 28$$

THIS EQUATION FEATURES:

- A LINEAR TERM WITH AN UNKNOWN VARIABLE (x) ,
- CONSTANTS,
- A DISTRIBUTIVE PROPERTY INVOLVING $(-4(x - 1))$.

OUR GOAL IS TO ISOLATE (x) AND FIND ITS VALUE, ENSURING THAT EACH STEP IS TRANSPARENT AND JUSTIFIED.

STEP 1: RECOGNIZE THE STRUCTURE OF THE EQUATION

THE EQUATION CONTAINS:

- A TERM $(7x)$,
- A CONSTANT (-9) ,
- A DISTRIBUTIVE EXPRESSION $(-4(x - 1))$,
- AN EQUAL SIGN WITH A CONSTANT (28) .

TO SOLVE FOR (x) , WE NEED TO:

- EXPAND THE DISTRIBUTIVE PART,
- COMBINE LIKE TERMS,
- ISOLATE (x) ,
- SIMPLIFY SYSTEMATICALLY.

STEP 2: EXPAND THE DISTRIBUTIVE TERM

THE FIRST IMPORTANT STEP IS TO EXPAND $(-4(x - 1))$ USING THE DISTRIBUTIVE PROPERTY:

$$\begin{aligned} &[-4(x - 1) = -4 \times x + (-4) \times (-1) = -4x + 4 \\ &] \end{aligned}$$

EXPLANATION:

- MULTIPLY (-4) BY EACH TERM INSIDE THE PARENTHESES.
- $(-4 \times x = -4x)$.
- $(-4 \times -1 = +4)$ (SINCE TWO NEGATIVES MAKE A POSITIVE).

UPDATED EQUATION:

$$\begin{aligned} &[7x - 9 - 4x + 4 = 28 \\ &] \end{aligned}$$

STEP 3: COMBINE LIKE TERMS

NEXT, GROUP THE (x) -TERMS AND CONSTANTS:

$$\begin{aligned} &[(7x - 4x) + (-9 + 4) = 28] \end{aligned}$$

CALCULATIONS:

$$\begin{aligned} &- (7x - 4x = 3x), \\ &- (-9 + 4 = -5). \end{aligned}$$

SIMPLIFIED EQUATION:

$$\begin{aligned} &[3x - 5 = 28] \end{aligned}$$

STEP 4: ISOLATE THE VARIABLE TERM

TO SOLVE FOR (x) , ADD 5 TO BOTH SIDES OF THE EQUATION TO MOVE CONSTANTS TO THE RIGHT:

$$\begin{aligned} &[3x - 5 + 5 = 28 + 5] \end{aligned}$$

SIMPLIFY:

$[$

$$3x = 33$$

\]

EXPLANATION:

- ADDING 5 TO BOTH SIDES MAINTAINS EQUALITY, PER THE ADDITION PROPERTY.

STEP 5: SOLVE FOR (x)

DIVIDE BOTH SIDES BY 3 TO ISOLATE (x) :

\[

$$\frac{3x}{3} = \frac{33}{3}$$

\]

SIMPLIFY:

\[

$$x = 11$$

\]

RESULT: THE SOLUTION TO THE EQUATION IS $(x = 11)$.

STEP 6: VERIFY THE SOLUTION

VERIFYING YOUR ANSWER IS A CRUCIAL STEP TO ENSURE ACCURACY.

SUBSTITUTE $(x = 11)$ BACK INTO THE ORIGINAL EQUATION:

\[

$$7(11) - 9 - 4(11 - 1) = 28$$

\]

CALCULATE STEP-BY-STEP:

- \((7 \times 11 = 77)\),
- \((11 - 1 = 10)\),
- \((-4 \times 10 = -40)\).

PLUGGING IN:

$$\begin{aligned} & \backslash[\\ & 77 - 9 - 40 = 28 \\ & \backslash] \end{aligned}$$

SIMPLIFY:

$$\begin{aligned} & \backslash[\\ & (77 - 9) - 40 = 28 \\ & \backslash] \\ & \backslash[\\ & 68 - 40 = 28 \\ & \backslash] \\ & \backslash[\\ & 28 = 28 \\ & \backslash] \end{aligned}$$

SINCE BOTH SIDES ARE EQUAL, THE SOLUTION \((x = 11)\) IS VERIFIED.

SUMMARY OF THE SOLUTION PROCESS

TO SUMMARIZE, HERE'S A CONCISE LIST OF STEPS:

1. IDENTIFY THE PARTS OF THE EQUATION, NOTING THE DISTRIBUTIVE

EXPRESSION.

2. EXPAND $(-4(x - 1))$ TO $(-4x + 4)$.
3. COMBINE LIKE TERMS: $(7x - 4x)$ AND $(-9 + 4)$.
4. SIMPLIFY TO $(3x - 5 = 28)$.
5. ADD 5 TO BOTH SIDES TO ISOLATE THE TERM WITH (x) : $(3x = 33)$.
6. DIVIDE BOTH SIDES BY 3 TO SOLVE FOR (x) : $(x = 11)$.
7. VERIFY THE SOLUTION BY SUBSTITUTING $(x = 11)$ BACK INTO THE ORIGINAL EQUATION.

ADDITIONAL TIPS FOR SOLVING SIMILAR EQUATIONS

- ALWAYS EXPAND PARENTHESES FIRST TO SIMPLIFY THE EQUATION.
- COMBINE LIKE TERMS EARLY TO REDUCE COMPLEXITY.
- KEEP TRACK OF SIGNS CAREFULLY, ESPECIALLY WITH NEGATIVE COEFFICIENTS.
- USE INVERSE OPERATIONS (ADDITION/SUBTRACTION, MULTIPLICATION/DIVISION) SYSTEMATICALLY.
- VERIFY YOUR SOLUTION TO CATCH POTENTIAL ERRORS.

FINAL THOUGHTS

SOLVING ALGEBRAIC EQUATIONS LIKE " $7x - 9 - 4(x - 1) = 28$ " MAY SEEM DAUNTING INITIALLY, BUT BREAKING THE PROBLEM DOWN INTO MANAGEABLE STEPS MAKES THE PROCESS STRAIGHTFORWARD. REMEMBER, EACH STEP BUILDS UPON THE PREVIOUS ONE, LEADING YOU TO THE SOLUTION METHODICALLY. SHOWING ALL STEPS NOT ONLY HELPS IN VERIFYING YOUR WORK BUT ALSO DEEPENS YOUR UNDERSTANDING OF ALGEBRAIC PRINCIPLES.

BY MASTERING THESE TECHNIQUES, YOU'LL BE WELL-EQUIPPED TO HANDLE INCREASINGLY COMPLEX EQUATIONS AND DEVELOP A SOLID FOUNDATION FOR

HIGHER-LEVEL MATHEMATICS. PRACTICE REGULARLY, AND SOON SOLVING SUCH PROBLEMS WILL BECOME SECOND NATURE!

[SOLVE SHOWING AND EXPLAINING ALL STEPS IN THE PROCESS \$7 \times 9 \div 4 \times 1 \div 28\$](#)

SOLVE SHOWING AND EXPLAINING ALL STEPS IN THE PROCESS $7 \times 9 \div 4 \times 1 \div 28$

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