

# Reduce The Following Fractions To Simplest

Form:(a)  $\frac{48}{60}$ (b)  $\frac{150}{60}$ (c)  $\frac{84}{98}$ (d)

$\frac{12}{52}$ (e)  $\frac{7}{7}$

Reduce The Following Fractions To Simplest Form:(a)  $\frac{48}{60}$ (b)  $\frac{150}{60}$ (c)  $\frac{84}{98}$ (d)  $\frac{12}{52}$ (e)  $\frac{7}{7}$

Fractions are an essential part of mathematics, representing parts of a whole or ratios between quantities. Simplifying fractions to their simplest form makes calculations easier, comparisons clearer, and understanding better. In this article, we will explore the methods to reduce various fractions to their simplest form, with step-by-step explanations and useful tips to master the process.

## Understanding Fractions and Simplification

Before diving into the specific fractions, it's important to understand what it means to simplify a fraction.

### What Is a Simplified Fraction?

A fraction is said to be in its simplest form when the numerator (top number) and the denominator (bottom number) have no common factors other than 1. In other words, the greatest common divisor (GCD) of both numbers is 1.

### Why Simplify Fractions?

- Makes calculations easier
- Facilitates comparison between fractions
- Provides clearer understanding

- Essential for solving algebraic and mathematical problems efficiently

## Methods to Simplify Fractions

There are several methods to simplify fractions, but the most common and straightforward is dividing both numerator and denominator by their GCD.

### Step-by-Step Approach

1. Find the GCD of the numerator and denominator.
2. Divide both numerator and denominator by the GCD.
3. Write the resulting fraction; this is the simplified form.

## Applying the Method: Simplifying Each Fraction

Now, let's apply this method to each of the given fractions.

### (a) Simplify $48 / 60$

- Step 1: Find the GCD of 48 and 60.
- Factors of 48: 1, 2, 3, 4, 6, 8, 12, 16, 24, 48
- Factors of 60: 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60
- Common factors: 1, 2, 3, 4, 6, 12
- GCD: 12
- Step 2: Divide numerator and denominator by 12.
- $48 \div 12 = 4$
- $60 \div 12 = 5$
- Result:  $4 / 5$

### **(b) Simplify 150 / 60**

- Step 1: Find the GCD of 150 and 60.
- Factors of 150: 1, 2, 3, 5, 6, 10, 15, 25, 30, 50, 75, 150
- Factors of 60: 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60
- Common factors: 1, 2, 3, 5, 6, 10, 15, 30
- GCD: 30
- Step 2: Divide numerator and denominator by 30.
- $150 \div 30 = 5$
- $60 \div 30 = 2$
- Result:  $5 / 2$

### **(c) Simplify 84 / 98**

- Step 1: Find the GCD of 84 and 98.
- Factors of 84: 1, 2, 3, 4, 6, 7, 12, 14, 21, 28, 42, 84
- Factors of 98: 1, 2, 7, 14, 49, 98
- Common factors: 1, 2, 7, 14
- GCD: 14
- Step 2: Divide numerator and denominator by 14.
- $84 \div 14 = 6$
- $98 \div 14 = 7$
- Result:  $6 / 7$

### **(d) Simplify 12 / 52**

- Step 1: Find the GCD of 12 and 52.
- Factors of 12: 1, 2, 3, 4, 6, 12
- Factors of 52: 1, 2, 4, 13, 26, 52
- Common factors: 1, 2, 4
- GCD: 4

- Step 2: Divide numerator and denominator by 4.
- $12 \div 4 = 3$
- $52 \div 4 = 13$
- Result:  $3 / 13$

**(e) Simplify  $7 /$  (assuming the same pattern, but since only numerator is given, we interpret as  $7 / 1$ )**

- Since the fraction is  $7 /$  (no denominator specified), assuming it's  $7 / 1$  (which is already in simplest form).
- Alternatively, if intended as a fraction with an unspecified denominator, it remains 7 over whatever denominator, but typically, as written, 7 is a whole number or a fraction with denominator 1.
- Result:  $7 / 1$  (already in simplest form)

## **Additional Tips for Simplifying Fractions**

- Always find the GCD to ensure the fraction is in its simplest form.
- Use prime factorization for larger numbers to find the GCD efficiently.
- Remember, if numerator and denominator are both divisible by a common factor, dividing by that factor reduces the fraction.
- Practice with different fractions to build confidence.

## **Real-Life Applications of Simplifying Fractions**

Simplifying fractions isn't just a mathematical exercise; it has practical applications in everyday life:

- Cooking: Adjusting recipes by simplifying ratios.

- Finance: Simplifying interest rates or ratios.
- Construction: Simplifying measurements.
- Education: Clarifying concepts for better understanding.

## Conclusion

Reducing fractions to their simplest form is a fundamental skill in mathematics that enhances problem-solving efficiency and clarity. By mastering the process of finding the greatest common divisor and dividing both numerator and denominator, you can simplify any fraction quickly and accurately.

Whether dealing with straightforward fractions like  $48/60$  or more complex ratios, these techniques are invaluable tools in your mathematical toolkit. Practice regularly, and soon simplifying fractions will become second nature, making your mathematical journey smoother and more enjoyable.

## Frequently Asked Questions

### How do you reduce the fraction $48/60$ to its simplest form?

Divide numerator and denominator by their greatest common divisor, which is 12. So,  $48 \div 12 = 4$  and  $60 \div 12 = 5$ , making the simplified fraction  $4/5$ .

### What is the simplest form of the fraction $150/60$ ?

Divide numerator and denominator by their greatest common divisor, which is 30. So,  $150 \div 30 = 5$  and  $60 \div 30 = 2$ , resulting in the simplified fraction  $5/2$ .

### How can you reduce $84/98$ to its simplest form?

Find the greatest common divisor, which is 14. Divide both numerator and denominator by 14:  $84 \div 14 = 6$  and  $98 \div 14 = 7$ , so the simplified fraction is  $6/7$ .

## What is the simplest form of $12/52$ ?

Divide numerator and denominator by their greatest common divisor, which is 4. So,  $12 \div 4 = 3$  and  $52 \div 4 = 13$ , giving the simplified fraction  $3/13$ .

## How do you simplify the fraction $7/?$ (assuming the denominator is missing)?

Without the denominator, the fraction cannot be simplified. Make sure to know the complete fraction to reduce it to its simplest form.

## Why is it important to reduce fractions to their simplest form?

Reducing fractions simplifies calculations, makes comparison easier, and helps in understanding the value of the fraction more clearly.

## Additional Resources

Reduce The Following Fractions To Simplest Form: An In-Depth Analysis

Fractions are fundamental components of mathematics that express the division of one quantity by another. Whether in elementary education or advanced mathematical computations, understanding how to reduce fractions to their simplest form is crucial. Simplification not only aids in easier comprehension but also ensures clarity in problem-solving and data representation. In this comprehensive article, we delve into the process of reducing fractions to their simplest form, analyzing specific examples: (a)  $48/60$ , (b)  $150/60$ , (c)  $84/98$ , (d)  $12/52$ , and (e)  $7/?$  — examining the underlying principles, methods, and significance involved.

---

# The Significance of Simplifying Fractions

Before exploring the specific examples, it's essential to understand why simplifying fractions matters:

- Clarity and Readability: Simplified fractions are easier to interpret and compare.
- Mathematical Operations: Simplification makes addition, subtraction, multiplication, and division more straightforward.
- Standardization: It establishes a common form, facilitating communication and consistency across mathematical tasks.
- Educational Foundation: Mastery of fraction reduction is foundational for advanced topics like algebra, calculus, and probability.

---

## Mathematical Foundations of Fraction Reduction

### Understanding the Greatest Common Divisor (GCD)

At the core of reducing fractions lies the concept of the Greatest Common Divisor (GCD), also known as the Greatest Common Factor (GCF). The GCD of two integers is the largest positive integer that divides both without leaving a remainder.

Methods to find GCD:

- Listing Factors: List all factors of both numerator and denominator; the largest common factor is the GCD.
- Prime Factorization: Break down both numbers into prime factors; multiply the common prime factors to find the GCD.

- Euclidean Algorithm: An efficient iterative process based on division to compute GCD.

Example:

To reduce  $48/60$ , find  $\text{GCD}(48, 60)$ :

- Prime factors of 48:  $2^4 \cdot 3$
- Prime factors of 60:  $2^2 \cdot 3 \cdot 5$
- Common prime factors:  $2^2 \cdot 3$
- GCD:  $2^2 \cdot 3 = 4 \cdot 3 = 12$

Once GCD is identified, dividing numerator and denominator by the GCD simplifies the fraction.

---

## Step-by-Step Reduction of the Given Fractions

Let's analyze each example systematically.

### (a) $48 / 60$

Step 1: Find  $\text{GCD}(48, 60)$ :

- Prime factors:  $48 = 2^4 \cdot 3$
- Prime factors:  $60 = 2^2 \cdot 3 \cdot 5$
- Common factors:  $2^2 \cdot 3 = 4 \cdot 3 = 12$

Step 2: Divide numerator and denominator by GCD:

-  $48 \div 12 = 4$

-  $60 \div 12 = 5$

Result:  $4/5$

Conclusion: The fraction  $48/60$  simplifies to  $4/5$ .

---

## **(b) $150 / 60$**

Step 1: Find  $\text{GCD}(150, 60)$ :

- Prime factors of 150:  $2 \cdot 3 \cdot 5^2$

- Prime factors of 60:  $2^2 \cdot 3 \cdot 5$

- Common factors:  $2 \cdot 3 \cdot 5 = 30$

Step 2: Divide numerator and denominator by GCD:

-  $150 \div 30 = 5$

-  $60 \div 30 = 2$

Result:  $5/2$

Conclusion: The fraction  $150/60$  simplifies to  $5/2$ , an improper fraction representing  $2 \frac{1}{2}$ .

---

### (c) $84 / 98$

Step 1: Find  $\text{GCD}(84, 98)$ :

- Prime factors of 84:  $2^2 \cdot 3 \cdot 7$
- Prime factors of 98:  $2 \cdot 7^2$
- Common factors:  $2 \cdot 7 = 14$

Step 2: Divide numerator and denominator by GCD:

- $84 \div 14 = 6$
- $98 \div 14 = 7$

Result:  $6/7$

Conclusion: The simplified form of  $84/98$  is  $6/7$ .

---

### (d) $12 / 52$

Step 1: Find  $\text{GCD}(12, 52)$ :

- Prime factors of 12:  $2^2 \cdot 3$
- Prime factors of 52:  $2^2 \cdot 13$
- Common factors:  $2^2 = 4$

Step 2: Divide numerator and denominator by GCD:

- $12 \div 4 = 3$
- $52 \div 4 = 13$

Result:  $3/13$

Conclusion: The fraction  $12/52$  reduces to  $3/13$ .

---

**(e)  $7 / ?$**

This appears to be an incomplete fraction as the denominator is missing. Assuming the intended problem is to explore fractions involving 7, perhaps a typo or omission occurred. For the sake of completeness, consider possible scenarios:

- If the aim is to reduce 7 over some denominator, say, 14:
- $\text{GCD}(7, 14) = 7$
- Simplified:  $7 \div 7 = 1$ ,  $14 \div 7 = 2$ , so  $1/2$
- Alternatively, if the denominator is 1:
- $7/1$  is already in simplest form.

Note: Clarification is needed for this particular case.

---

# Common Mistakes and Misconceptions in Simplification

Understanding pitfalls helps reinforce correct methods:

- Assuming numerators and denominators are coprime without verification: Always check GCD.
- Dividing by numbers that are not common factors: This leads to incorrect simplification.
- Neglecting to reduce fractions fully: For example,  $48/60$  was reduced to  $4/5$ , not  $8/10$ .
- Misinterpreting improper fractions: Simplification may result in mixed numbers or improper fractions; recognize their forms.

---

## Advanced Techniques and Applications

Beyond basic reduction, advanced strategies include:

- Using prime factorization for large numbers: Facilitates quick GCD calculations.
- Applying Euclidean Algorithm programmatically: Useful in computational contexts.
- Reducing fractions in algebraic expressions: Ensures expressions are in simplest form for further operations.
- Converting to mixed numbers where appropriate: When improper fractions are simplified, converting to mixed numbers can aid understanding.

Applications include:

- Simplifying ratios in statistics and data analysis.
- Reducing fractions in probability calculations.
- Simplifying algebraic fractions in higher mathematics.
- Ensuring clarity in scientific data representation.

---

## Conclusion

Reducing fractions to their simplest form is a foundational skill in mathematics that enables clearer communication, efficient computation, and deeper understanding. The process hinges on the identification of the GCD—either through prime factorization or the Euclidean Algorithm—and dividing numerator and denominator by this value.

In the examined examples:

- $48/60$  reduces to  $4/5$
- $150/60$  reduces to  $5/2$
- $84/98$  reduces to  $6/7$
- $12/52$  reduces to  $3/13$

The incomplete fraction involving 7 underscores the importance of complete information for proper reduction.

Mastery of fraction simplification paves the way for proficiency in more complex mathematical concepts and real-world applications. Whether dealing with ratios, proportions, or algebraic expressions, the ability to reduce fractions efficiently is an indispensable skill in a mathematician's toolkit.

---

## References:

- Elementary Number Theory, David M. Burton
- Basic Mathematics, Serge Lang
- Online GCD calculators and prime factorization tools

- Educational websites and math tutorials on fraction reduction

## **Reduce The Following Fractions To Simplest Form A 48 60 B 150 60 C 84 98 D 12 52 E 7**

Reduce The Following Fractions To Simplest Form A 48 60 B 150 60 C 84 98 D 12 52 E 7

## **Related Articles**

- [PLEASE HELP MEAn Expression Is Shown Below: \$6x^2y - 3xy - 24xy^2 + 12y^2\$ Part A: Rewrite The Expression By](#)
- [The Artistic Carving Or Removing Of Hair Lengths To Create Various Forms And Shapes Is Defined As:A\)](#)
- [Read This Excerpt From "The Day The Gulls Went Crazy" By Susan E. Quinlan.Capturing And Rebanding An](#)

[Back to Home](#)