

Order These Fractions From Smallest To Lowest

$$\frac{1}{2}, \frac{7}{12}, \frac{2}{17}$$

Order These Fractions From Smallest To Largest: $\frac{1}{2}$, $\frac{7}{12}$, $\frac{2}{17}$

Understanding how to compare fractions and arrange them from smallest to largest is a fundamental skill in mathematics, especially in fractions, ratios, and proportions. In this guide, we will explore how to order the fractions $\frac{1}{2}$, $\frac{7}{12}$, and $\frac{2}{17}$ from smallest to largest. We will discuss various methods for comparing fractions, including converting to decimals, finding common denominators, and cross-multiplication, providing a comprehensive understanding suitable for learners at different levels.

Introduction to Comparing Fractions

Before diving into the specific fractions, it is essential to understand the basics of comparing fractions. Fractions represent parts of a whole, and comparing them involves understanding their size relative to each other.

Key Concepts in Fraction Comparison

- **Numerator and Denominator:** The numerator indicates how many parts are considered, while the denominator indicates the total number of equal parts the whole is divided into.
- **Equivalent Fractions:** Fractions that represent the same value but have different numerators and denominators.
- **Methods to Compare Fractions:** There are mainly three methods:
 - Converting to decimals
 - Finding a common denominator
 - Cross-multiplication

Method 1: Converting Fractions to Decimals

One straightforward way to compare fractions is to convert each to its decimal form by dividing the numerator by the denominator. This method provides a clear numerical value that can be easily compared.

Step-by-Step Conversion

1. $\frac{1}{2}$: Divide 1 by 2 $\rightarrow$ 0.5
2. $\frac{7}{12}$: Divide 7 by 12 $\rightarrow$ approximately 0.5833
3. $\frac{2}{17}$: Divide 2 by 17 $\rightarrow$ approximately 0.1176

Comparison of Decimals

- $\frac{2}{17} \approx 0.1176$
- $\frac{1}{2} = 0.5$
- $\frac{7}{12} \approx 0.5833$

Result: The order from smallest to largest based on decimal conversion is:

$$\boxed{\frac{2}{17} < \frac{1}{2} < \frac{7}{12}}$$

This method is quick and effective, especially with the help of a calculator, but it is essential to note that decimal approximations can sometimes introduce rounding errors for more complex fractions.

Method 2: Finding a Common Denominator

Another reliable method involves converting each fraction to an equivalent fraction with a common denominator. This allows direct comparison of the numerators.

Steps to Find a Common Denominator

1. Identify the denominators: 2, 12, and 17.
2. Find the least common multiple (LCM) of these denominators.

Calculating the LCM

◦ Prime factorization:

- $2 = 2$
- $12 = 2^2 \cdot 3$
- $17 = 17$ (prime)

◦ LCM is the product of the highest powers of all primes:

- 2^2 (from 12), 3 (from 12), and 17 (prime itself)

◦ $\text{LCM} = 2^2 \cdot 3 \cdot 17 = 4 \cdot 3 \cdot 17 = 4 \cdot 51 = 204$

3. Convert each fraction to an equivalent fraction with denominator 204.

Converting Fractions

- $\left(\frac{1}{2}\right)$: Multiply numerator and denominator by $\left(\frac{102}{102}\right)$ to get $\left(\frac{102}{204}\right)$
- $\left(\frac{7}{12}\right)$: Multiply numerator and denominator by $\left(\frac{17}{17}\right)$ to get $\left(\frac{119}{204}\right)$
- $\left(\frac{2}{17}\right)$: Multiply numerator and denominator by $\left(\frac{12}{12}\right)$ to get $\left(\frac{24}{204}\right)$

Comparison of Numerators

- $\frac{102}{204}$: numerator 102
- $\frac{119}{204}$: numerator 119
- $\frac{24}{204}$: numerator 24

Order from smallest to largest:

```
\[
\boxed{
\frac{2}{17} (\frac{24}{204}) < \frac{1}{2} (\frac{102}{204}) < \frac{7}{12}
(\frac{119}{204})
}
```

This method is precise and effective for comparing fractions with different denominators, especially when dealing with more complex fractions.

Method 3: Cross-Multiplication

Cross-multiplication is a quick mental math technique to compare two fractions without converting to decimals or common denominators.

How to Use Cross-Multiplication

1. Compare two fractions, for example, $\frac{a}{b}$ and $\frac{c}{d}$.
2. Calculate $(a \times d)$ and $(c \times b)$.
3. If $(a \times d < c \times b)$, then $\frac{a}{b} < \frac{c}{d}$.

Applying Cross-Multiplication to Our Fractions

1. Compare $\frac{1}{2}$ and $\frac{7}{12}$:
 - $(1 \times 12 = 12)$
 - $(7 \times 2 = 14)$

Since $12 < 14$, $\frac{1}{2} < \frac{7}{12}$.

2. Compare $\frac{1}{2}$ and $\frac{2}{17}$:

- $1 \times 17 = 17$

- $2 \times 2 = 4$

Since $17 > 4$, $\frac{2}{17} < \frac{1}{2}$.

3. Compare $\frac{7}{12}$ and $\frac{2}{17}$:

- $7 \times 17 = 119$

- $2 \times 12 = 24$

Since $119 > 24$, $\frac{2}{17} < \frac{7}{12}$.

Final Order from smallest to largest:

$$\boxed{\frac{2}{17} < \frac{1}{2} < \frac{7}{12}}$$

Cross-multiplication is especially handy for quick comparisons without performing full conversions or finding common denominators.

Summary of Methods and Final Ordering

To summarize, the three methods—decimal conversion, common denominator, and cross-multiplication—each arrive at the same conclusion:

- $\frac{2}{17}$ is the smallest.
- $\frac{1}{2}$ is in the middle.
- $\frac{7}{12}$ is the largest.

Ordered list from smallest to largest:

1. $\frac{2}{17}$
2. $\frac{1}{2}$
3. $\frac{7}{12}$

Practical Applications of Ordering Fractions

Understanding how to compare and order fractions is vital in various real-world scenarios and academic contexts:

- **Cooking and Recipes:** Adjusting ingredient quantities based on ratios.
- **Financial Calculations:** Comparing interest rates or ratios.
- **Data Analysis:** Ranking proportions or percentages.
- **Educational Assessments:** Solving math problems involving

Frequently Asked Questions

How do I compare the fractions $\frac{1}{2}$, $\frac{7}{12}$, and $\frac{2}{17}$ to order them from smallest to largest?

You can compare these fractions by converting them to common denominators or decimals. For example, $\frac{1}{2} = 0.5$, $\frac{7}{12} \approx 0.583$, and $\frac{2}{17} \approx 0.118$. So, from smallest to largest: $\frac{2}{17}$, $\frac{1}{2}$, $\frac{7}{12}$.

What is the easiest way to order fractions like $\frac{1}{2}$, $\frac{7}{12}$, and $\frac{2}{17}$?

The simplest method is to convert each fraction to a decimal and then compare the decimal values. Alternatively, find a common denominator and compare numerators.

Are there any quick mental strategies to compare these fractions without converting to decimals?

Yes! You can cross-multiply to compare two fractions at a time. For example, compare $\frac{1}{2}$ and $\frac{7}{12}$ by cross-multiplying: $1 \times 12 = 12$ and $2 \times 7 = 14$. Since $12 < 14$, $\frac{1}{2} < \frac{7}{12}$. Repeat this process to order all three.

What is the decimal equivalent of $\frac{1}{2}$, $\frac{7}{12}$, and $\frac{2}{17}$?

$\frac{1}{2} = 0.5$, $\frac{7}{12} \approx 0.583$, $\frac{2}{17} \approx 0.118$. Based on these, the order from smallest to largest is $\frac{2}{17}$, $\frac{1}{2}$, $\frac{7}{12}$.

Why is it important to learn to compare fractions like $\frac{1}{2}$, $\frac{7}{12}$, and $\frac{2}{17}$?

Being able to compare fractions helps in understanding proportions, making calculations easier, and solving real-world problems involving parts of a whole.

Can I use a calculator to order these fractions quickly?

Yes, entering the decimal equivalents of the fractions into a calculator makes it quick and easy to compare and order them accurately.

What is the correct order of the fractions $\frac{1}{2}$, $\frac{7}{12}$, and $\frac{2}{17}$ from smallest to largest?

The correct order from smallest to largest is $\frac{2}{17}$, $\frac{1}{2}$, $\frac{7}{12}$.

Additional Resources

Order These Fractions From Smallest To Largest: A Comprehensive Guide

Understanding how to order fractions from smallest to largest is a fundamental skill in mathematics that enhances number sense and problem-solving capabilities. When faced with the fractions $\frac{1}{2}$, $\frac{7}{12}$, and $\frac{2}{17}$, the challenge lies in accurately comparing their sizes despite their different denominators. This process involves understanding the values these fractions represent and applying strategies to determine their relative sizes efficiently. In this guide, we will explore step-by-step methods to order these fractions from smallest to largest, including common techniques like finding common denominators, converting to decimals, and cross-multiplying. Whether you're a student brushing up on

fractions or someone looking to refine your comparison skills, this detailed analysis will clarify the process and help you develop confidence in ordering fractions.

Understanding the Fractions

Before diving into comparison techniques, let's briefly analyze each of the fractions in question:

- $\frac{1}{2}$: Represents one part out of two equal parts, which equals 0.5 in decimal form.
- $\frac{7}{12}$: Represents seven parts out of twelve, which is less than $\frac{1}{2}$ but more than $\frac{1}{3}$.
- $\frac{2}{17}$: Represents two parts out of seventeen, a much smaller fraction compared to the others.

At a glance, it's clear that $\frac{2}{17}$ is likely the smallest, but to confirm and precisely order all three, we need to use mathematical comparison methods.

Methods for Comparing Fractions

There are several effective techniques to compare fractions:

1. Converting Fractions to Decimals

The most straightforward way, especially when dealing with unfamiliar denominators, is to convert each fraction into a decimal:

- Divide numerator by denominator.
- Compare the resulting decimal values.

2. Finding a Common Denominator

This approach involves:

- Calculating the least common denominator (LCD) of all fractions.
- Rewriting each fraction with this common denominator.
- Comparing the numerators directly.

3. Cross-Multiplication

A quick mental or written technique whereby:

- Cross-multiplied numerators are compared.
- If $\frac{a}{b} < \frac{c}{d}$, then $a \cdot d < c \cdot b$.

This avoids finding a common denominator and can be faster for just a few comparisons.

Step-by-Step Comparison of the Fractions

Let's apply each method to order $1/2$, $7/12$, and $2/17$.

Method 1: Decimal Conversion

$$1/2: 1 \div 2 = 0.5$$

$$7/12: 7 \div 12 \approx 0.5833$$

$$2/17: 2 \div 17 \approx 0.1176$$

Ordering from smallest to largest based on decimal values:

- $2/17 \approx 0.1176$ (smallest)
- $1/2 = 0.5$
- $7/12 \approx 0.5833$ (largest)

$$\text{Result: } 2/17 < 1/2 < 7/12$$

Method 2: Common Denominator Approach

Find the least common denominator (LCD) for 2, 12, and 17.

- Prime factors:
- $2 = 2$
- $12 = 2^2 \cdot 3$
- 17 is prime
- $\text{LCD} = 2^2 \cdot 3 \cdot 17 = 4 \cdot 3 \cdot 17 = 204$

Convert each fraction:

- $1/2: (1 \times 102) / 204 = 102/204$
- $7/12: (7 \times 17) / 204 = 119/204$
- $2/17: (2 \times 12) / 204 = 24/204$

Order numerators:

$102 < 119 < 24$? No, 24 is less than 102 and 119, so we need to double-check.

Actually, $24 < 102 < 119$, so the order is:

- $24/204$ (which is $2/17$)
- $102/204$ (which is $1/2$)
- $119/204$ (which is $7/12$)

Thus, the fractions in order from smallest to largest are:

$$2/17 < 1/2 < 7/12$$

Method 3: Cross-Multiplication

Compare $1/2$ and $7/12$:

- Cross-multiplied: $1 \times 12 = 12$; $2 \times 7 = 14$

Since $12 < 14$, $1/2 < 7/12$

Compare $1/2$ and $2/17$:

- Cross-multiplied: $1 \times 17 = 17$; $2 \times 2 = 4$

Since $17 > 4$, $1/2 > 2/17$

Compare $7/12$ and $2/17$:

- Cross-multiplied: $7 \times 17 = 119$; $12 \times 2 = 24$

Since $119 > 24$, $7/12 > 2/17$

Putting it all together:

- $2/17$ is less than $1/2$
- $1/2$ is less than $7/12$

Final ordering:

$$2/17 < 1/2 < 7/12$$

Summary: Ordering the Fractions

Based on the comparison methods above, the fractions $1/2$, $7/12$, and $2/17$ in order from smallest to largest are:

$$2/17, 1/2, 7/12$$

This ordering can be confirmed through multiple methods, showcasing the

importance of understanding different comparison strategies.

Additional Tips for Comparing Fractions

- Always consider converting to decimals if you need a quick estimate.
- Find common denominators when exact comparison is necessary, especially for more complex fractions.
- Use cross-multiplication for quick mental comparisons, especially when dealing with only two fractions at a time.
- Approximate when in doubt: understanding the approximate size of fractions helps build intuition.

Practice Exercise

Try ordering these fractions from smallest to largest:

- $\frac{3}{8}$, $\frac{5}{12}$, $\frac{7}{16}$

Use the methods described above to determine their order. This practice will reinforce your skills and help you become more comfortable comparing fractions with different denominators.

Conclusion

Ordering fractions from smallest to largest involves understanding their relative sizes and applying appropriate comparison methods. Whether converting to decimals, finding common denominators, or cross-multiplying, each technique offers valuable insights. For the specific set $\frac{1}{2}$, $\frac{7}{12}$, and $\frac{2}{17}$, we've demonstrated that $\frac{2}{17}$ is the smallest, followed by $\frac{1}{2}$, and then $\frac{7}{12}$. Mastery of these comparison strategies will not only help in classroom settings but also develop a deeper appreciation of fractions and their relationships within the number system.

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