# The Ratio Of Purple Cars To Red Cars In A Car Park Is 89 : 53. Rewrite This As An Equivalent Ratio Of

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## Understanding Ratios and Their Significance

### What Is a Ratio?

A ratio is a mathematical expression that compares two quantities, indicating how many times one value contains or is contained within the other. Ratios are fundamental in various fields such as mathematics, statistics, and real-world applications like analyzing data or understanding proportions.

### Importance of Equivalent Ratios

Equivalent ratios are different ratios that express the same relationship between quantities. They help in simplifying complex data, making comparisons easier, and understanding proportions more clearly. For example, recognizing that 2:4 is equivalent to 1:2 allows for easier calculations and better insights.

## Original Ratio: Purple Cars to Red Cars

The original ratio given is:

- Purple Cars: 89
- Red Cars: 53

Expressed as 89:53.

## How to Find Equivalent Ratios

## Method 1: Using Multiplication or Division

To find an equivalent ratio, multiply or divide both parts of the original ratio by the same non-zero number.

1. Choose a number to multiply or divide both terms by.
2. Apply the operation to each part of the ratio.
3. Ensure the same operation is applied to both parts to maintain equivalence.

## Method 2: Cross-Multiplication

Cross-multiplication helps verify if two ratios are equivalent by checking if the products are equal.

# Rewriting 89:53 as an Equivalent Ratio

## Step 1: Simplify the Ratio

Find the greatest common divisor (GCD) of 89 and 53.

- Since 89 is a prime number, and 53 is also prime, they do not share any common divisors other than 1.
- Therefore, the ratio cannot be simplified further.

## Step 2: Find Equivalent Ratios by Multiplication

To express 89:53 in an equivalent form, choose a multiplier. For example, multiplying both parts by 2:

- $89 \times 2 = 178$
- $53 \times 2 = 106$

Resulting in the ratio: 178:106.

Similarly, multiplying by 3:

- $89 \times 3 = 267$
- $53 \times 3 = 159$

Resulting in: 267:159.

### Step 3: Expressing as Fractions

Convert the ratio into a fraction to better understand the relationship:

$$
\frac{89}{53} \approx 1.679
$$

Any fraction equivalent to this value will represent an equivalent ratio.

## Examples of Equivalent Ratios of 89:53

### Using Different Multipliers

Here are some equivalent ratios obtained by multiplying both parts by various numbers:

- 1: $\frac{89}{53}$ (original ratio)
- 2: 178:106
- 3: 267:159
- 4: 356:212
- 5: 445:265
- 10: 890:530

### Expressing in Simplified Form

Since 89 and 53 are coprime (have no common factors other than 1), the ratio 89:53 is already in its simplest form. Any other equivalent ratio will be a multiple of these numbers.

# Practical Applications of Equivalent Ratios

## 1. Vehicle Color Distribution Analysis

Understanding the proportion of purple to red cars helps in:

1. Inventory Management: Ensuring adequate stock of each color.
2. Marketing Strategies: Tailoring advertising based on popularity.
3. Customer Preferences: Analyzing trends for future planning.

## 2. Scaling Ratios for Different Contexts

Suppose a car park expansion plans to double the total number of cars. Using the equivalent ratio:

- Purple Cars: $89 \times 2 = 178$
- Red Cars: $53 \times 2 = 106$

This helps in projecting future inventory needs or capacity planning.

## 3. Educational Purposes

Teaching students about ratios and their equivalence is fundamental in mathematics education. Using real-world examples like car colors makes abstract concepts tangible and relevant.

# Conclusion: The Significance of Expressing Ratios Clearly

Expressing the ratio of purple cars to red cars in an equivalent form enhances understanding and facilitates easier comparison, scaling, and analysis. Whether in business, education, or everyday scenarios, being able to convert ratios into different equivalent forms is a valuable skill that aids in making informed decisions and clear communication.

In the case of the original ratio 89:53, recognizing that it cannot be simplified further underscores its unique relationship. By multiplying both parts by various numbers, we can generate a host of equivalent ratios, all maintaining the same underlying proportion. This flexibility in representing ratios is essential across many disciplines and practical applications, from inventory management to educational demonstrations.

Remember: Always verify the equivalence of ratios through cross-multiplication or by checking their decimal equivalents to ensure accurate comparisons and calculations.

# Frequently Asked Questions

## What is an equivalent ratio for the ratio of purple cars to red cars, 89:53?

An equivalent ratio can be found by multiplying both terms by the same number. For example, multiplying both by 2 gives 178:106, which is equivalent.

## How can I simplify the ratio 89:53 to its simplest form?

Since 89 and 53 have no common factors other than 1, the ratio 89:53 is already in its simplest form.

## Can you express the ratio 89:53 as a fraction in simplest form?

Yes, the ratio 89:53 can be written as the fraction 89/53, which is already in simplest form since 89 and 53 are coprime.

## What are some equivalent ratios to 89:53 using whole numbers?

Some equivalent ratios include 178:106, 267:159, or 356:212, obtained by multiplying both parts by 2, 3, or 4 respectively.

## If the ratio of purple to red cars is 89:53, what is the ratio of purple to total cars?

The ratio of purple cars to total cars is 89 divided by (89 + 53) = 89/142, which simplifies approximately to 0.627.

## How would you write the ratio 89:53 as a percentage for purple cars in the car park?

Purple cars make up approximately (89 / (89 + 53)) × 100 ≈ 62.7% of the cars in the parking lot.

## If there are 142 cars in total, how many are purple and how many are red based on the ratio 89:53?

Based on the ratio, approximately 89 cars are purple and 53 are red out of the total 142 cars.

# Additional Resources

The Ratio Of Purple Cars To Red Cars In A Car Park Is 89 : 53. Rewrite This As An Equivalent Ratio Of

When examining ratios, especially in real-world contexts like the distribution of vehicle colors in a parking lot, understanding how to manipulate and interpret these ratios is crucial. The ratio of purple cars to red cars in a car park is given as 89:53. This figure provides a snapshot of the parking lot’s color distribution, but to fully grasp its implications or to communicate it effectively, it's often necessary to express this ratio in an equivalent form. This comprehensive analysis aims to explore how to rewrite the ratio 89:53 as an equivalent ratio, the mathematical principles behind it, practical applications, and deeper insights into ratio conversions.

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# Understanding Ratios: Basic Concepts

Before delving into rewriting ratios, it’s essential to understand what ratios represent and their fundamental properties.

## What Is a Ratio?

- A ratio compares two quantities, showing how many times one value contains or is contained within the other.
- It is expressed in the form a:b, where ‘a’ and ‘b’ are numbers representing quantities of two different entities—in this case, purple and red cars.
- Ratios can compare parts of a whole, entire quantities, or rates.

## Properties of Ratios

- Ratios can be simplified by dividing both terms by their greatest common divisor (GCD).
- Equivalent ratios represent the same relationship between quantities but may be expressed with different numbers.
- Ratios can be scaled up or down by multiplying or dividing both terms by the same number.

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# Given Ratio: 89 : 53

In our specific case, the ratio of purple cars to red cars is 89:53.

- Interpretation: For every 89 purple cars, there are 53 red cars.
- Observation: Since both numbers are integers, the ratio is in its initial, most basic form unless

further simplified.

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# Rewriting the Ratio as an Equivalent Ratio

The primary goal is to find other ratios that have the same relationship as 89:53, known as equivalent ratios.

## Methods for Finding Equivalent Ratios

1. Multiplying Both Terms by the Same Number

- This is the most straightforward way to generate an equivalent ratio.
- For example, multiplying both 89 and 53 by 2 yields:

$$
89 \times 2 = 178, \quad 53 \times 2 = 106
$$

- Equivalent ratio: 178:106

2. Dividing Both Terms by the Same Number (if possible)

- To simplify ratios, dividing both terms by their GCD can produce an equivalent ratio in simplest form.
- Find GCD of 89 and 53:

- Since 89 is prime and 53 is prime, and they share no common factors other than 1, the GCD is 1.
- Therefore, 89:53 is already in simplest form.

3. Scaling with Other Factors

- Multiply both parts by various integers (positive whole numbers) to generate a family of equivalent ratios.

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## Examples of Equivalent Ratios

| Multiplier | Purple Cars | Red Cars | Resulting Ratio |
|---|---|---|---|
| 1 | 89 | 53 | 89:53 |
| 2 | 178 | 106 | 178:106 |
| 3 | 267 | 159 | 267:159 |

| | | | |
|---|---|---|---|
| 4 | 356 | 212 | 356:212 |
| 5 | 445 | 265 | 445:265 |
| 10 | 890 | 530 | 890:530 |

Note: These ratios all maintain the same relationship as the original ratio, just scaled versions.

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# Expressing the Ratio in Different Forms

Beyond multiplying or dividing, ratios can be expressed in various formats to suit different contexts.

## Fraction Form

- The ratio 89:53 can be written as a fraction:

$$
\frac{89}{53}
$$

- This fractional form can be simplified or converted into decimal form.

## Decimal Form

- Divide numerator by denominator:

$$
\frac{89}{53} \approx 1.6792
$$

- Interpretation: There are approximately 1.679 purple cars for every red car.

## Percentage Form

- To express the ratio as a percentage, compare the two quantities:

$$
\left( \frac{89}{53} \right) \times 100\% \approx 167.92\%
$$

- Interpretation: Purple cars constitute approximately 167.92% of the red cars in the parking lot.

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# Practical Applications of Rewriting Ratios

Understanding how to rewrite ratios as equivalent ratios has several practical implications, especially in real-world scenarios such as analyzing parking lot data, budgeting, or resource allocation.

## 1. Scaling for Predictions and Planning

- If a parking lot is observed to have a certain ratio at a specific time, equivalent ratios allow us to predict or plan for different scenarios.
- For example, if the lot has 89 purple and 53 red cars, then:

- In a larger event expecting 178 purple cars, the expected red cars would be:

$$
\text{Red Cars} = \frac{53}{89} \times 178 \approx 106
$$

- This proportional reasoning hinges on understanding equivalent ratios.

## 2. Communication and Data Presentation

- Converting ratios into different forms makes data easier to understand or communicate.
- For example, expressing the ratio as a decimal (≈1.6792) or percentage (≈167.92%) can be more intuitive for certain audiences or reports.

## 3. Comparing Multiple Ratios

- When dealing with multiple categories or groups, expressing ratios equivalently helps in comparison.
- For example, comparing the proportions of purple and red cars to other colors in the lot.

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# Deep Dive into Ratio Simplification and Equivalence

While the initial ratio of 89:53 is in simplest form, understanding why and how ratios can be simplified or transformed is fundamental.

### Greatest Common Divisor (GCD)

- Simplify ratios by dividing both numbers by their GCD.
- Since 89 and 53 are prime, the GCD is 1; thus, 89:53 cannot be simplified further.

### Implications of Simplified Ratios

- Simplified ratios provide the most concise representation.
- They are useful for quick comparisons or when ratios are used as parameters in calculations.

### Converting to Proportions and Rates

- Ratios can be expressed as proportions (fractions) or rates.
- For example, the proportion of purple cars:

$$
\frac{89}{89 + 53} = \frac{89}{142} \approx 0.627
$$

- About 62.7% of cars are purple.

- The red car proportion:

$$
\frac{53}{142} \approx 0.373
$$

- About 37.3% are red.

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## Visualizing the Ratio

Visual representations can often make understanding ratios more intuitive.

### Pie Charts

- A pie chart dividing the total cars into purple and red sections:

- Purple segment: 62.7%
- Red segment: 37.3%

### Bar Graphs

- Bar graphs with two bars, one for purple cars (height proportional to 89) and one for red cars (height proportional to 53), scaled appropriately.

### Scaling for Visualization

- To visualize the ratio effectively, choose a common scale.
- For instance, if each unit equals 10 cars:

- Purple cars: 890
- Red cars: 530

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## Key Takeaways and Summary

- The ratio 89:53 compares the number of purple cars to red cars in a parking lot.
- Since 89 and 53 are coprime, the ratio is already in simplest form.
- To find equivalent ratios, multiply both parts by the same integer.
- The fundamental principle behind equivalent ratios is proportionality; multiplying or dividing both parts by the same number maintains the original relationship.
- Converting ratios into fractions, decimals, or percentages helps in better interpretation and communication.
- Visual tools like pie charts and bar graphs aid in understanding the distribution.
- Recognizing the importance of ratios in real-world scenarios enhances decision-making, planning, and data communication.

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## Conclusion

Rewriting the ratio of purple cars to red cars in a car park as an equivalent ratio is more than a mere mathematical exercise; it’s a practical skill essential for data analysis, communication, and decision-making. Whether scaling up for larger scenarios, simplifying for clarity, or converting into different formats for better understanding, mastering the concept of equivalent ratios empowers you to interpret and present data more effectively.

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