One Fraction Is Between 1 And 2 Less Than Another Fraction Or Decimal.List Three Possible Pairs Of Fractions

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Understanding the relationship between fractions and decimals is fundamental in mathematics, especially when analyzing inequalities and comparative values. A common problem involves identifying pairs of fractions or decimals where one value is specifically between 1 and 2 less than the other. This concept is especially useful in algebra, number theory, and practical applications like measurements and financial calculations. In this article, we will explore the meaning of such inequalities, demonstrate how to identify pairs of fractions satisfying this condition, and list three possible examples. Whether you're a student, educator, or math enthusiast, this comprehensive guide will deepen your understanding of fractional relationships.

Understanding the Concept: What Does "Between 1 And 2 Less Than" Mean?

Before diving into specific pairs, it's essential to clarify what the phrase "one fraction is between 1 and 2 less than another fraction or decimal" entails mathematically.

Defining the Relationship

Suppose we have two quantities, A and B, where both are fractions or decimals. The statement "A is between 1 and 2 less than B" translates into an inequality involving A and B:

$$B - 2 < A < B - 1$$

This means:

- A is less than $B - 1$, i.e., $A < B - 1$
- A is greater than $B - 2$, i.e., $A > B - 2$

In other words, A lies strictly between $B - 2$ and $B - 1$.

Interpreting the Inequality

- The interval $(B - 2, B - 1)$ contains all possible values of A that satisfy the condition.
- The difference between A and B lies in the range of 1 to 2 units, specifically:

$$
1 < B - A < 2
$$

which can be rearranged as:

$$
-2 < A - B < -1
$$

or equivalently,

$$
B - 2 < A < B - 1
$$

This provides a clear criterion for selecting pairs of fractions or decimals.

How to Find Pairs of Fractions or Decimals Satisfying the Condition

To list possible pairs, we need to select a value for B (the "larger" fraction or decimal) and then find corresponding A values that satisfy the inequalities.

Step-by-Step Approach

1. Choose a value for B: Select a fraction or decimal that will serve as the reference value.
2. Determine the interval for A: Calculate $B - 2$ and $B - 1$.
3. Select A within the interval: Pick fractions or decimals that lie strictly between $B - 2$ and $B - 1$.
4. Verify the inequality: Confirm that A indeed satisfies $B - 2 < A < B - 1$.

Examples of Pairs of Fractions and Decimals

Using the method outlined, let's list three possible pairs of fractions or decimals where one is between 1 and 2 less than the other.

Example 1: Pair with $B = \frac{5}{2}$ (which is 2.5)

- Calculate the interval for A:

$$
B - 2 = 2.5 - 2 = 0.5
$$
$$
B - 1 = 2.5 - 1 = 1.5
$$

- A must satisfy:

$$
0.5 < A < 1.5
$$

- Possible choices for A:

- Fraction: $\frac{1}{2} = 0.5$ (but since the inequality is strict, A must be greater than 0.5, so $\frac{1}{2}$ is not acceptable unless strict inequality allows equality—here, it does not)

- Fraction within interval: $\frac{3}{4} = 0.75$, $\frac{4}{3} \approx 1.33$

- Selected pair:
$\boxed{\left(\frac{3}{4}, \frac{5}{2}\right)}$
Because:

$$
\frac{5}{2} - 2 = 0.5 < \frac{3}{4} = 0.75 < 1.5 = \frac{3}{2}
$$

which satisfies:

$$
0.5 < 0.75 < 1.5
$$

Example 2: Pair with \(B = 3\) (a whole number)

- Calculate the interval for \(A\):

\[
3 - 2 = 1
\]
\[
3 - 1 = 2
\]

- \(A\) must satisfy:

\[
1 < A < 2
\]

- Possible choices for \(A\):

- Fraction: \(\frac{3}{2} = 1.5\)
- Decimal: 1.8
- Fraction: \(\frac{7}{4} = 1.75\)

- Selected pair:
\(\boxed{\left(\frac{7}{4}, 3\right)}\)

Since:

\[
3 - 2 = 1 < \frac{7}{4} = 1.75 < 2 = 3 - 1
\]

the pair satisfies the inequality criteria.

Example 3: Pair with \(B = 1.8\) (a decimal)

- Calculate the interval for \(A\):

\[
1.8 - 2 = -0.2
\]
\[
1.8 - 1 = 0.8
\]

- \(A\) must satisfy:

$$
-0.2 < A < 0.8
$$

- Possible choices:

- Decimal: 0.5
- Fraction: $\frac{1}{2} = 0.5$
- Decimal: -0.1

- Selected pair:
$\boxed{\left(\frac{1}{2}, 1.8\right)}$

Because:

$$
1.8 - 2 = -0.2 < 0.5 < 0.8 = 1.8 - 1
$$

which confirms the pair meets the condition.

Additional Examples and Variations

Beyond the three examples above, many other pairs of fractions or decimals fulfill the inequality. Here are some more options:

- Pair with $B = 4$:
A must be between 2 and 3.
Example: $\left(\frac{5}{2}, 4\right)$

- Pair with $B = 0.5$:
A must be between -1.5 and -0.5.
Example: $\left(-\frac{3}{2}, 0.5\right)$

- Pair with $B = 7/3 \approx 2.33$:
A is between $2.33 - 2 = 0.33$ and $2.33 - 1 = 1.33$.
Example: $A = \frac{2}{3} \approx 0.666$

Applications of the Concept in Real-World Contexts

Understanding these fractional relationships is not just an academic exercise; it has practical applications in various fields:

- Financial Calculations: Comparing rates or prices where differences are within specific ranges.
- Measurement and Engineering: Ensuring tolerances are within certain bounds, especially when dealing with fractions of units.
- Data Analysis: Identifying data points that fall within a certain range relative to others.
- Educational Purposes: Teaching inequalities, fractions, and their relationships.

Conclusion

Identifying pairs of fractions or decimals where one is between 1 and 2 less than another involves understanding inequalities and interval selection. By choosing a reference value \(B\), calculating the interval \((B - 2, B - 1)\), and selecting \(A\) within that range, you can generate numerous valid pairs. The three examples provided illustrate this process and demonstrate the diversity of possible pairs across different types of fractions and decimals.

Mastering this concept enhances your ability to work with inequalities, compare fractional and decimal values, and apply these skills in both academic and real-world situations. Whether you're solving mathematical problems, analyzing data, or working on measurements, understanding the relationship between fractions and their differences is a valuable tool in your mathematical toolkit.

Keywords: fractions, decimals, inequalities, fractional relationships, number comparisons, mathematical inequalities, fractional pairs, decimal pairs, inequalities between fractions, fractional intervals

Frequently Asked Questions

What does it mean for one fraction to be between 1 and 2 less than another fraction or decimal?

It means that the difference between the larger fraction or decimal and the smaller one is greater than 1 but less than 2, indicating the first is in the range (difference > 1 and < 2) from the second.

Can you list three pairs of fractions where one is between 1 and 2 less than the other?

Yes. Examples include: (1/2, 2/3), (3/4, 5/6), (7/8, 15/16). In each pair, the difference between the second and the first is between 1 and 2.

How do I determine if one fraction is between 1 and 2 less than another?

Subtract the smaller fraction from the larger one; if the result is more than 1 but less than 2, then the first is between 1 and 2 less than the second.

Why is it important to find such pairs of fractions?

Identifying these pairs helps in understanding ratios, differences, and relative sizes of fractions or decimals, which is useful in math problem-solving and real-world comparisons.

Can this concept be applied to decimal numbers as well?

Yes, the same principle applies to decimals; if the difference between two decimals is between 1 and 2, then one decimal is between 1 and 2 less than the other.

Additional Resources

Understanding Fractions: Exploring Pairs Where One Is Between 1 and 2 Less Than Another

When delving into the world of fractions and decimals, one intriguing concept that often puzzles students and math enthusiasts alike is the relationship between two numbers where one is "between 1 and 2 less than" the other. This phrase may seem ambiguous at first glance, but with a clear understanding, it reveals a fascinating pattern in numbers and their differences. Today, we will explore this concept in depth, analyzing what it means for one fraction or decimal to be between 1 and 2 less than another, and we'll provide three well-chosen examples that illustrate this relationship perfectly.

Deciphering the Phrase: "One Fraction Is Between 1 And 2 Less Than Another"

What Does It Mean?

At its core, the phrase describes a relationship between two numbers—say, two fractions or decimals—where the difference between the larger and the smaller number falls somewhere between 1 and 2. More precisely:

- If we have two numbers, A and B, with A > B, then:

$A - B > 1$ and $A - B < 2$

- Alternatively, if B is less than A by an amount between 1 and 2, then:

$A - B \in (1, 2)$

This means the difference between the two numbers is strictly greater than 1 but less than 2.

Key insight: The phrase does not refer to the actual values of the fractions themselves relative to 1 or 2, but rather to the difference between them.

Mathematical Representation of the Relationship

Expressing the Concept Formally

Let's formalize this idea:

Given two fractions or decimals, x and y, the condition is:

$$1 < x - y < 2$$

or equivalently,

$$y = x - d \quad \text{where} \quad d \in (1, 2)$$

In words:

- x is the larger number.
- y is the smaller number.
- The difference between x and y is more than 1 but less than 2.

Note: Both x and y can be fractions or decimals, and the difference condition remains the same.

Practical Examples: Three Pairs of Fractions

To better understand this concept, let's examine three pairs of fractions that satisfy the condition difference between 1 and 2. Each pair will be analyzed in detail to illustrate how their differences fit within this range.

Example 1: $\frac{7}{4}$ and $\frac{3}{4}$

Pair Description:

- Larger fraction: $\frac{7}{4} = 1.75$
- Smaller fraction: $\frac{3}{4} = 0.75$

Calculating the Difference:

$$
\frac{7}{4} - \frac{3}{4} = \frac{7 - 3}{4} = \frac{4}{4} = 1
$$

Analysis:

- The difference is exactly 1, which is the lower bound of our range (greater than 1 but not less).
- Since the difference is equal to 1, this pair almost fits the criteria but does not satisfy the strict inequality > 1.

Adjusting to meet the condition:

To satisfy greater than 1 but less than 2, let's consider a slight modification:

- Larger fraction: $\frac{9}{4} = 2.25$
- Smaller fraction: $\frac{7}{4} = 1.75$

Difference:

$$
\frac{9}{4} - \frac{7}{4} = \frac{2}{4} = 0.5
$$

Too small; so let's try:

- Larger fraction: $\frac{11}{4} = 2.75$
- Smaller fraction: $\frac{9}{4} = 2.25$

Difference:

$$
\frac{11}{4} - \frac{9}{4} = \frac{2}{4} = 0.5
$$

Again, too small. To get a difference between 1 and 2, pick:

- Larger fraction: $\frac{9}{4} = 2.25$
- Smaller fraction: $\frac{7}{4} = 1.75$

Difference:

$$
2.25 - 1.75 = 0.5
$$

No, still too small.

Let's choose:

- Larger: $\frac{13}{4} = 3.25$
- Smaller: $\frac{7}{4} = 1.75$

Difference:

$$
3.25 - 1.75 = 1.5
$$

Result:

- The difference is 1.5, which satisfies $1 < 1.5 < 2$.

Conclusion:

Pair: $\left(\frac{13}{4}, \frac{7}{4}\right)$

Difference: 1.5

This pair demonstrates a clear example where the difference between two fractions is comfortably between 1 and 2.

Example 2: $\frac{9}{5}$ and $\frac{4}{5}$

Fraction values:

- Larger: $\frac{9}{5} = 1.8$
- Smaller: $\frac{4}{5} = 0.8$

Difference:

$$
1.8 - 0.8 = 1.0
$$

Again, the difference is exactly 1, which is at the boundary but doesn't satisfy the strict inequality > 1. To find a suitable pair, consider:

- Larger: $\frac{19}{10} = 1.9$
- Smaller: $\frac{9}{10} = 0.9$

Difference:

$$
1.9 - 0.9 = 1.0
$$

Same as previous; just at the boundary. Let's try:

- Larger: $\frac{12}{5} = 2.4$
- Smaller: $\frac{10}{5} = 2.0$

Difference:

$$
2.4 - 2.0 = 0.4
$$

Too small. Next:

- Larger: $\frac{7}{3} \approx 2.33$
- Smaller: $\frac{5}{3} \approx 1.66$

Difference:

$$
2.33 - 1.66 \approx 0.67
$$

Still too small. Let's pick:

- Larger: $\frac{11}{4} = 2.75$
- Smaller: $\frac{7}{4} = 1.75$

Difference:

$$
2.75 - 1.75 = 1.0
$$

Again, exactly 1.

Now, to get a difference strictly between 1 and 2, consider:

- Larger: $\frac{17}{5} = 3.4$
- Smaller: $\frac{13}{5} = 2.6$

Difference:

$$
3.4 - 2.6 = 0.8
$$

No, too small. Next:

- Larger: $\frac{19}{5} = 3.8$
- Smaller: $\frac{16}{5} = 3.2$

Difference:

$$
3.8 - 3.2 = 0.6
$$

No. Let's go with:

- Larger: $\frac{8}{3} \approx 2.666...$
- Smaller: $\frac{5}{3} \approx 1.666...$

Difference:

$$
2.666... - 1.666... \approx 1.0
$$

Similarly, trying:

- Larger: $\frac{10}{4} = 2.5$
- Smaller: $\frac{8}{4} = 2.0$

Difference:

$$
2.5 - 2.0 = 0.5
$$

No, too small. To summarize, the key is to find fractions where the difference lies strictly between 1 and 2. Let's choose:

- Larger: $\frac{19}{10} = 1.9$
- Smaller: $\frac{9}{10} = 0.9$

Difference:

\[
1.9 - 0.9 = 1.0
\]

Again, at the boundary. To get a difference between 1 and 2, choose:

- Larger: \(\frac{8}{4} = 2\)
- Smaller: \(\frac{0.5}{1} = 0.5\)

Difference:

\[
2 - 0.5 = 1.5
\]

Result:

Pair: \(\left(\frac{2}{1}, \frac{1}{2}\right)\)

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