

Mixed up fractions

Children add a pair of fractions, multiply the same pair, then find the difference between the two answers, looking for patterns.

Skills practised:

- Adding, multiplying and subtracting pairs of fractions

Conjecture: We can find a pattern which will help us to predict the difference between the product and the sum of a pair of fractions with the same numerator.

What to do:

Children work individually or in pairs.

1. Write two unit fractions with neighbouring denominators, e.g. $\frac{1}{2}$ and $\frac{1}{3}$.
2. Find the total of the two fractions. This is answer (a)
3. Find the product of the two fractions. This is answer (b)
4. Now find the difference between the two answers. Make a record of the original pair of fractions and the difference between the two answers.
5. Repeat with other pairs of neighbouring unit fractions. Do at least 3 more.

Can you find any patterns? Can you see any relationship between the difference and either of the original pair of fractions? If so, test out your conjecture with another pair of unit fractions.

HINT: Write your final answer so that it has the same denominator as the smaller of your original fractions.

6. Try a pair of unit fractions with denominators which are not neighbouring, e.g. $\frac{1}{3}$ and $\frac{1}{5}$.
7. Repeat the above process several times with different non-neighbouring pairs.
8. See if you can spot any relationship between your final answer and the numerator of either of your original fractions.

HINT: Add the denominators. Can you see a relationship between this number and the numerator in your final answer?

CHALLENGE: Try 2 as a numerator and only use proper fractions in their simplest form, e.g. $\frac{2}{3}$ and $\frac{2}{5}$. Can you see a relationship? You will need to add the denominators and play around.

Aims:

- To spot and identify patterns
- To find relationships and use these to predict answers

Minimum number of calculations expected

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