



INVESTIGATION



Calculator Fractions

0.34343434...

0.465465465...

2.47834783...

MathSphere

Calculator Fractions

Make a recurring decimal by repeating one digit, such as:

0.444444444...

Using your calculator, do a division sum that gives this decimal in the calculator display.

Your calculator may show a different number of decimal places.

That's not a problem!

Make up a table of all the recurring decimals that repeat just one digit and try to get them all. Is there an easy way of doing this?

Ideas to try:

1. Try two-digit recurring decimals such as 0.28282828...

Can you find a quick way to decide which numbers need to be divided to put the decimal in your calculator display?

2. What about three-digit, four-digit, five-digit etc repeating decimals?

3. Can you find several division sums that give the same decimals?

Eg. Can you find four division sums that give 0.37373737... ?

4. What about decimals with a whole number at the beginning?
Eg. Can you find division sums that give:

0.3434343434..., 1.3434343434... 2.3434343434... etc ?

Answer Guide

To produce a recurring decimal you simply divide by 9, 99, 999 etc, depending on the number of recurring digits.

Eg. $0.444444444\ldots$ is $4 \div 9$

$0.353535353\ldots$ is $35 \div 99$ etc

Children need to be aware that the last digit may be rounded up,

Eg. $0.66666666\ldots$ may show in the calculator as 0.66666667

This does not mean their answer is incorrect.

To produce several sums that give the same answer, children need to be aware of the use of equivalent fractions.

Eg. If $45 \div 99 = 0.45454545\ldots$, then $90 \div 198$ and $135 \div 297$ etc will give the same answer.

To put a whole number in front of the decimal, this must be converted to 9ths, 99ths, 999ths etc.

Eg. if $4 \div 9 = 0.4444444\ldots$, then $13 \div 9 = 1.4444444\ldots$,
 $22 \div 9 = 2.4444444\ldots$ etc

Eg. If $35 \div 99 = 0.35353535\ldots$, then $134 \div 99 = 1.35353535\ldots$ etc.