

# Halfway Between

Junior high school/  
Elementary school  
(upper grades)

## Objective

Understand and use fractions.

Calculate with fractions and understand the results.

## Explanation of the activity

Use the calculator to find the fraction that is exactly halfway between two other fractions.

Look for patterns to help understand how to find the answer without using the calculator.

This activity reinforces addition of common fractions and considers the result of dividing common fractions by integers. By working on the activity, students should also develop an increasing feel for the relative sizes of fractions.

## Using the calculator

Calculator functions used: Addition, division, multiplication, fraction, calculation

Press the following buttons and then start operation.

ON/C MODE 0

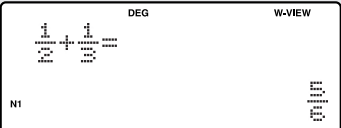
SET UP 2 0

### Example A:

Find the fraction that is halfway between  $\frac{1}{2}$  and  $\frac{1}{3}$ .

Using fractional calculation, obtain the sum of  $\frac{1}{2}$  and  $\frac{1}{3}$ .

1  $\frac{a}{b}$  2  $\blacktriangleright$  + 1  $\frac{a}{b}$  3 =

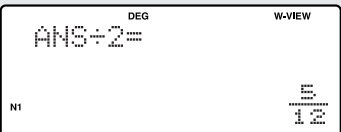


DEG W-VIEW  
 $\frac{1}{2} + \frac{1}{3} =$   
N1  $\frac{5}{6}$

<Display 1>

Half of this fraction is the number you are looking for, so divide this fraction by 2.


$\div$  2 =



DEG W-VIEW  
ANS $\div$ 2=  
N1  $\frac{5}{12}$

Or after <Display 1>, multiply by  $\frac{1}{2}$ .

$\times$  1  $\frac{a}{b}$  2 =



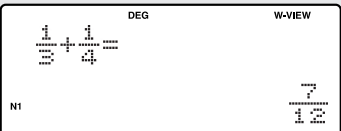
DEG W-VIEW  
ANS $\times$  $\frac{1}{2}$ =  
N1  $\frac{5}{24}$

### Example B:

Find the fraction that is halfway between  $\frac{1}{3}$  and  $\frac{1}{4}$ .

Using fractional calculation, obtain the sum of  $\frac{1}{3}$  and  $\frac{1}{4}$ .

1  $\frac{a}{b}$  3  $\blacktriangleright$  + 1  $\frac{a}{b}$  4 =



DEG W-VIEW  
 $\frac{1}{3} + \frac{1}{4} =$   
N1  $\frac{7}{12}$

<Display 2>

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Half of this fraction is the number you are looking for, so divide this fraction by 2.

$$\boxed{\div} \ 2 \ \boxed{=}$$

Or after <Display 2>, multiply by  $\frac{1}{2}$ .

$$\boxed{\times} \ 1 \ \boxed{a/b} \ 2 \ \boxed{=}$$

A calculator display in DEG mode, W-VIEW, showing the result of dividing the previous answer by 2. The display shows "ANS ÷ 2 =" followed by the fraction  $\frac{7}{24}$ . The label "N1" is visible in the bottom left corner.

A calculator display in DEG mode, W-VIEW, showing the result of multiplying the previous answer by 1/2. The display shows "ANS × 1/2 =" followed by the fraction  $\frac{7}{24}$ . The label "N1" is visible in the bottom left corner.

Continue the activity using other common fractions.

## ••••• Using the activity in the classroom •••••

This activity could follow the study of addition of common fractions.

The activity is best introduced orally. Ask the students to give different fractions that lie between  $\frac{5}{12}$  and  $\frac{2}{3}$ . One possibility is to arrange these on a fraction line. It is important that students are challenged to justify their answers and, in some cases, it may be appropriate to consider decimal equivalents. The students should then be asked to identify the common fraction that is halfway between  $\frac{5}{12}$  and  $\frac{8}{12}$ , justifying their answer.

## ••••• Points for students to discuss •••••

Furthering the activity, students can be asked to give fractions that lie between  $\frac{1}{2}$  and  $\frac{1}{3}$  and identify the common fraction that is halfway between them. At this stage it may be necessary to discuss methods for finding a number that is halfway between two numbers. Students can then use their calculators to identify fractions that are halfway between other unit fractions. This can be extended to non-unit fractions. It is important that students are encouraged to understand what is happening.

### **Further Ideas**

- Find fractions that lie  $\frac{1}{3}$  of the way between two fractions, or  $\frac{1}{4}$  of the way between two fractions, etc.