

GEN
iOX

CORE

MATHEMATICS

$$23 + 12 - 7 \cdot 2$$



SECONDARY 1

ANDALUSIA

1 Decimal numbers: representation

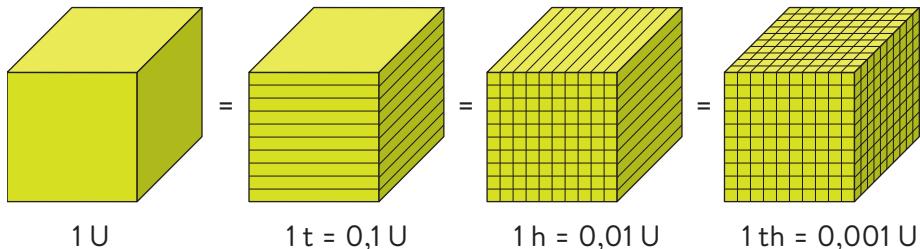
Lost in translation

In Spanish, we use a comma (,) to separate the integer part of a number from its decimal part. However, in English, we use a decimal point (.). For example, we write the number 5,5 in Spanish as 5.5 in English.

Pablo buys a book for €12,75.

Integer			,	t	h	th
M	T	U				
	1	2	,	7	5	

1 Ten
2 Units
7 tenths
5 hundredths



A **decimal number** has an integer part and a decimal part, separated by a comma.

- The **integer part** is everything to the left of the comma: units, tens, hundreds, and so on.
- The **decimal part** is everything to the right of the comma: tenths, hundredths, thousandths, and so on.

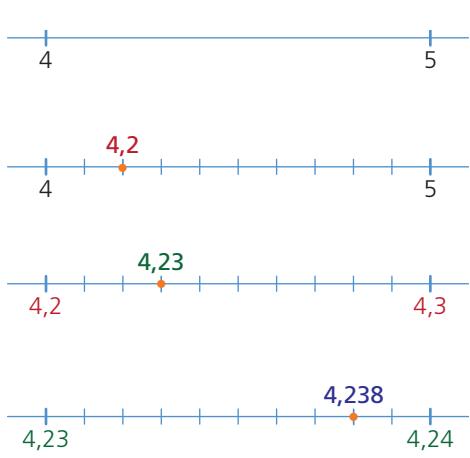
With a decimal number, we read the integer and then the decimal part, from largest to smallest – although this is not the only way to do it.

H	T	U	,	t	h	th	
	1	2	,	7	5		12 units and 75 hundredths
							12 units and 750 thousandths
							12 units, 7 tenths, 5 hundredths
							12 comma 75

Representing decimal numbers

To represent the number 4,238 on a number line, follow these steps.

- Find the integer on the number line, and the next integer.
- Divide the space into 10 equal parts, or tenths.
- Divide each tenth into ten equal parts, or hundredths.
- By doing this repeatedly, we get successively smaller decimal units.



Activities

- 1 Copy and complete the table in your notebook.

Number	Integer part	Decimal part	Read as
43,002	[]	[]	[]
0,3679	[]	[]	[]
321,99	[]	[]	[]
9 152,4	[]	[]	[]

Take note

A ten-thousandth is the place value after a thousandth.

- 2 Write these using numbers

- a) twelve units and three tenths
- b) fifty and three hundredths
- c) ten units and three thousandths
- d) two hundred and three ten thousandths

- 3 What value does 8 have in these numbers?

- a) 803,50
- b) 58,106
- c) 2,08
- d) 15,807

- 4 Copy and complete.

- a) 3 tenths = [] thousandths
- b) 0,23 units = [] tenths
- c) 7,9 hundredths = [] thousandths
- d) 325 thousandths = [] hundredths

- 5 Write a number that fits each description.

- a) a number with 900 units
- b) a number with 9 in the thousandths column
- c) The number has 3 units and 25 thousandths.
- d) The number of tens is greater than the number of tenths.

- 6 Write a number with 23 units, 43 tenths and 37 hundredths.



...



Remember

$$51,104 = 50 + 1 + 0,1 + 0,004$$

- 7 Using the Remember box above, write these numbers as a sum of their component parts.

- a) 47,91
- b) 6,007
- c) 12,9732
- d) 0,0001

- 8 Copy this number line and mark the decimal numbers below on it.

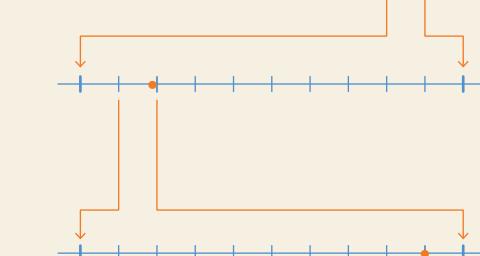
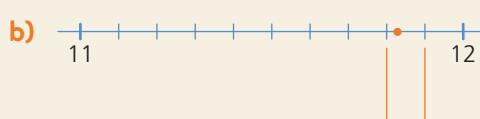


- a) 3,3
- b) 3,9
- c) 3,6
- d) 3,5

- 9 Mark these decimal numbers on separate number lines.

- a) 6,23
- b) 7,3
- c) 0,705
- d) 2,31

- 10 Which decimal numbers are marked on these number lines?



CLIL zone

- 11 Listen! Look at these decimal numbers. Then listen and write true or false.

- a) 48,952
- b) 79,0035
- c) 32,59
- d) 12,005
- e) 0,9745
- f) 984,35

2 Adding, subtracting and multiplying decimal numbers

Take note

To add or subtract decimal numbers, align them on their commas. If needed, add one or more zeros to the decimal part of the number.

Amelia is 1,65 m tall. She has two brothers: Rafa is 0,2 m taller than Amelia, and Santiago is 0,672 m shorter than Amelia. How tall are her brothers?

Rafa's height:

$$\begin{array}{r} 1, \ 6 \ 5 \\ + 0, \ 2 \ 0 \\ \hline 1, \ 8 \ 5 \end{array}$$

Santiago's height:

$$\begin{array}{r} 1, \ 6 \ 5 \ 0 \\ - 0, \ 6 \ 7 \ 2 \\ \hline 0, \ 9 \ 7 \ 8 \end{array}$$

Rafa is 1,85 m tall and Santiago is 0,978 m tall.



To **add or subtract decimal numbers**, align them on the commas and add or subtract just like with integers.

Lidia makes jam and uses lemon juice as a preservative. Today she bought 4,2 kg of lemons that cost €1,95 per kg. How much did she pay?

Multiply the numbers the same way as with integers.

$$\begin{array}{r} 1,95 \\ \times 4,2 \\ \hline 390 \\ + 780 \\ \hline 8,190 \end{array}$$

19mt1score119

2 decimal places
1 decimal place
3 decimal places

The number of decimal places in the answer is the sum of the number of decimal places in the two numbers that were multiplied.

She paid €8,19 for the lemons.

Take note

When we multiply a decimal number by an integer or decimal power of 10, if there aren't enough decimal places, add zeros.

To **multiply two decimal numbers**, temporarily ignore the commas and multiply just like with integers. You will get an integer answer at this stage. Now, count the **total** number of digits on the right side of the commas in the two numbers you multiplied. Place the comma in your answer so there are this many digits to the right of the comma.

Multiplication by integer and decimal powers of 10

Look at these multiplications.

$$\begin{array}{lll} 43,25 \cdot 10 = 432,5 & 43,25 \cdot 100 = 4\,325 & 43,25 \cdot 1\,000 = 43\,250 \\ 43,25 \cdot 0,1 = 4,325 & 43,25 \cdot 0,01 = 0,4325 & 43,25 \cdot 0,001 = 0,04325 \end{array}$$

- To **multiply a decimal number by an integer power of 10**, move the comma to the right as many places as there are zeros in the power of 10. For example, $55,103 \cdot 100 = 5\,510,3$
- To **multiply a decimal number by a decimal power of 10**, move the comma to the left as many places as there are zeros in the power of 10, **including** the zero to the left of the comma. For example, $116,885 \cdot 0,001 = 0,116885$

Activities

12 Do these calculations in your notebook.

- a) $3,06 + 12,792 + 4,0907$
- b) $9,0954 + 0,49 + 31,7 + 10,675$
- c) $43,8 + 78,153 + 12 + 3,71$
- d) $54,7808 + 42 + 1,707 + 51,9$

13 Do these calculations.

- | | |
|----------------------|----------------------|
| a) $45,801 - 32,009$ | c) $0,9 - 0,849$ |
| b) $7,35 - 5,782$ | d) $52,001 - 45,979$ |

14 Perform these calculations.

- a) $43,31 - 7,29 + 3,983$
- b) $52,9 + 32,5 - 27,95$
- c) $18,583 - 3,7 - 12,98$

15 Copy and complete these calculations.

- a) $7,5 \square 8 + 4, \square 35 = 11,873$
- b) $43, \square 5 \square + 32,57 = 75,829$
- c) $12,61 - 8,0 \square \square = 4,564$
- d) $3,7 - 2, \square \square 4 = 0,746$

16 Do these multiplications.

- | | |
|--------------------|----------------------|
| a) $5 \cdot 6,77$ | d) $32 \cdot 0,792$ |
| b) $9,084 \cdot 8$ | e) $1,9374 \cdot 12$ |
| c) $15 \cdot 9,3$ | f) $43 \cdot 7,09$ |

17 Do these multiplications.

- | | |
|----------------------|-----------------------|
| a) $5,3 \cdot 4,7$ | d) $4,302 \cdot 0,91$ |
| b) $62,3 \cdot 0,89$ | e) $5,3 \cdot 1,008$ |
| c) $5,93 \cdot 3,7$ | f) $6,2 \cdot 5,39$ |

18 Multiply by the given power of 10.

- | | |
|--------------------------|--------------------------|
| a) $3,45 \cdot 100$ | e) $43,92 \cdot 10$ |
| b) $24,6 \cdot 0,1$ | f) $5,3 \cdot 0,01$ |
| c) $789 \cdot 0,001$ | g) $0,003 \cdot 10\,000$ |
| d) $4,7003 \cdot 1\,000$ | h) $37,9 \cdot 0,0001$ |

19 Copy and find the missing power of 10.

- a) $3,72 \cdot \square = 37,2$
- b) $4 \cdot \square = 0,0004$
- c) $0,07 \cdot \square = 70$
- d) $45,369 \cdot \square = 4\,536,9$
- e) $0,03 \cdot \square = 0,00003$
- f) $32,809 \cdot \square = 3280\,900$

CLIL zone

24 Copy the table. Listen and complete the time for each leg of the relay. Then calculate the team's total time. Which leg was the fastest?

First leg		Second leg		Third leg		Fourth leg	
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Worked example

20 Solve $17,8 - 5,2 \cdot 3,07$

Solution

When doing calculations with decimal numbers, we must still follow the order of mathematical operations.

1. First we do the multiplication.

$$\begin{array}{r} 3, \quad 0 \quad 7 \\ \times \quad 5, \quad 2 \\ \hline 6 \quad 1 \quad 4 \\ + \quad 1 \quad 5 \quad 3 \quad 5 \\ \hline 1 \quad 5, \quad 9 \quad 6 \quad 4 \end{array}$$

2. Then we do the subtraction.

$$\begin{array}{r} 1 \quad 7, \quad 8 \quad 0 \quad 0 \\ - \quad 1 \quad 5, \quad 9 \quad 6 \quad 4 \\ \hline 0 \quad 1, \quad 8 \quad 3 \quad 6 \end{array}$$

So:

$$17,8 - 5,2 \cdot 3,07 = 1,836$$

21 Do these calculations.

- a) $4,3 \cdot 0,1 + 0,32 \cdot 10$
- b) $12,401 + 3,7 \cdot 5$
- c) $7,26 - 1,65 \cdot 2,3$
- d) $31,27 + 0,45 \cdot 52,9$

22 Calculate these.

- a) $6,72 \cdot 6 + 5,3 \cdot 25,9 - 1,3$
- b) $0,32 \cdot 0,9 + 32 \cdot 0,1 - 0,089 \cdot 10$
- c) $45,9 - 7,27 \cdot 4,05 + 3\,671 \cdot 0,001$
- d) $72 \cdot 0,1 + 3 \cdot 7,93$

23 How many grams of each nutrient are there in six pots of yogurt?

Nutrient	Per pot (g)
Protein	5,3
Carbohydrate	8,8
Fat	0,4
Calcium	0,156

3 Dividing decimal numbers

Enrique buys two types of fabric. What is the price per metre for each type?

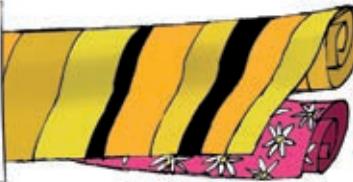
Take note

When a division doesn't give a whole number, we can continue dividing. To do this, put a comma after the quotient. Then turn the remaining units into tenths, the remaining tenths into hundredths, and so on.

$$\begin{array}{r} 1 \ 3 \\ 1 \ 0 \\ 2 \ 0 \\ \hline 0 \end{array} \quad \begin{array}{r} 4 \\ 3, \ 2 \ 5 \\ \hline 1 \ 8, \ 0 \end{array}$$

Sometimes, the remainder is never zero and the quotient has an unlimited number of decimal places.

Product	Quantity	Cost
Striped fabric	3 m	€54,75
Flowery fabric	5,2 m	€95,68



We can find the price of one metre of striped fabric by dividing $54,75 : 3$.

$$\begin{array}{r} 5 \ 4, \ 7 \ 5 \\ 2 \ 4 \\ 0 \ 7 \\ \hline 1 \ 8, \ 0 \end{array}$$

Bring down the tenths digit, 7, and put a comma after the quotient.

$$\begin{array}{r} 5 \ 4, \ 7 \ 5 \\ 2 \ 4 \\ 0 \ 7 \\ 1 \ 5 \\ 0 \end{array}$$

Keep dividing until you get a zero as the remainder.

So, one metre of striped fabric costs €18,25.

To **divide a decimal number by an integer**, treat both numbers as integers. When you bring down the tenths digit, put a comma after the quotient.

We can calculate the price per metre of flowery fabric by dividing $95,68 : 5,2$.



19mt1score120

$$\begin{array}{r} 95,68 : 5,2 \\ 956,8 \quad | \ 52 \\ 436 \quad 18,4 \\ 208 \quad 0 \\ \hline 9 \end{array}$$



One metre of flowery fabric costs €18,40.

To **divide a decimal number or an integer by a decimal number**, we multiply both the dividend and the divisor by 10, 100, and so on, depending on how many decimal places the divisor has. If it has 1 decimal place, we multiply by 10. If it has 2, we multiply by 100. After this, we divide as normal.

Division by integer and decimal powers of 10

Look at these divisions.

$$43,25 : 10 = 4,325 \quad 43,25 : 100 = 0,4325 \quad 43,25 : 1000 = 0,04325$$

$$43,25 : 0,1 = 432,5 \quad 43,25 : 0,01 = 4\ 325 \quad 43,25 : 0,001 = 43\ 250$$

- To **divide a decimal number by an integer power of 10**, we count how many zeros the divisor has. Then we move the comma to the left that number of places.
- To **divide a decimal number by a decimal power of 10**, we count how many decimal places the divisor has. Then we move the comma to the right that number of places.

Take note

Dividing a number by 0,1 is the same as multiplying a number by 10.

Activities

- 25** In your notebook, divide the numbers until the quotient has two decimal places.

a) $43 : 7$ c) $356 : 92$ e) $4530 : 71$
b) $159 : 23$ d) $1569 : 56$ f) $7291 : 183$

26 Do these calculations.

a) $86,1 : 7$ c) $86,568 : 12$ e) $1557,72 : 36$
b) $26,1 : 6$ d) $2392,5 : 29$ f) $282,776 : 52$

27 Do these calculations.

a) $65 : 2,5$ c) $12,24 : 7,2$ e) $0,93 : 1,5$
b) $225 : 0,05$ d) $32,16 : 9,6$ f) $5,146 : 0,62$

28 Divide by the given power of 10.

a) $49,9 : 0,01$ e) $904 : 0,001$
b) $0,06 : 0,1$ f) $349,29 : 10\,000$
c) $8,04 : 1000$ g) $0,003 : 0,0001$
d) $24,120 : 100$ h) $271,92 : 100$

Worked example

- 29 Do this calculation.

22,4 : 7 + (13,708 – 2,07) : 2,3

Solution

$22,4 : 7 + (13,708 - 2,07) : 2,3 =$

First perform the calculation in brackets.

$= 22,4 : 7 + 11,638 : 2,3 =$

Do both divisions.

$= 3,2 + 5,06 = 8,26$

Then do the addition.



19mt1score121

- 30** Find the answer for each combined operation.

 - a) $4,3 : 0,1 + 32,7 : 0,01 - 0,2$
 - b) $11,5 : 5 + 19,52 : 6,1$
 - c) $13,76 : 3,2 - 12,3 \cdot 0,3$
 - d) $5,31 + (15,02 + 17,204) : 6,08$
 - e) $37,2 : 0,1 + (100 - 11,1) : 7$

CLIL zone

- 36**  Work with a classmate. Use the phrases below to decide how to solve this problem. Then calculate the answer.

A strip of wood is 1,28 m long. Each time we cut it, we lose 0,001 m of wood. If we cut the strip into three pieces, how long will each piece be?

A strip of wood is 1,28 m long. Each time we cut it, we lose 0,001 m of wood. If we cut the strip into three pieces, how long will each piece be?

First we need to add/subtract/multiply/divide ... to/from/by... because... Then we need to...

Take note

In each step of a division, the remainder has the same place value as the one it's left over from.

When we divide 42 by 8, we get 5 units with a remainder of **2 units**. When we divide 20 tenths by 8, we get 2 tenths with a remainder of **4 tenths**.

$$\begin{array}{r} 4 \quad 2 \quad | \quad 8 \\ \textcolor{orange}{2} \qquad 5 \\ \hline \end{array} \qquad \begin{array}{r} 4 \quad 2 \quad | \quad 8 \\ \qquad \qquad 2 \quad 0 \quad 5, \quad 2 \\ \textcolor{orange}{4} \\ \hline \end{array}$$

We continue by dividing 40 hundredths by 8. Check there are no more hundredths remaining.

$$\begin{array}{r} 4 \ 2 \\ \underline{-} 2 \ 0 \\ 4 \ 0 \\ \underline{\quad} \end{array} \qquad \begin{array}{r} 8 \\ \hline 5, \ 2 \ 5 \end{array}$$

- 31** Calculate the quotient to one decimal place and find the remainder for each of these.

a) $5,4 : 6,23$ b) $17,34 : 8,2$

32 Calculate the quotient to two decimal places and find the remainder.

a) $3,24 : 1,9$ b) $6,43 : 5,4$

33 How many kilograms of pears has Ana bought?



- 34** A 500-sheet packet of paper weighs 2 490 g.
How much does one sheet weigh?

35 Eva buys 42,5 m of electrical cable for €80,75.
How much does one metre of cable cost?

4 Rounding and truncating decimal numbers

Take note

In English, we often see ‘decimal place(s)’ abbreviated as ‘d.p.’

This is how we round the number 3,6529 to various decimal places.

to 3 d.p.	3,653
to 2 d.p.	3,65
to 1 d.p.	3,7

For example, to round 3,6529 to 1 decimal place, we draw a line after the first decimal place.

3,6 |529

The first digit to the right of the line (5) is 5 or more, so we increase the previous digit (6) by 1, making it 7. Finally, we remove all digits to the right of the line.

Answer: 3,7

Take note

When we make an estimation of a decimal number, we introduce a **margin of error**. The margin of error is the absolute value of the difference between the number and the estimation.

$$\text{Error} = |\text{n.}^{\circ} - \text{estimation}|$$

We can make calculations with decimals easier by **rounding** or by **truncating**. When we do this, we get an **approximate** answer.

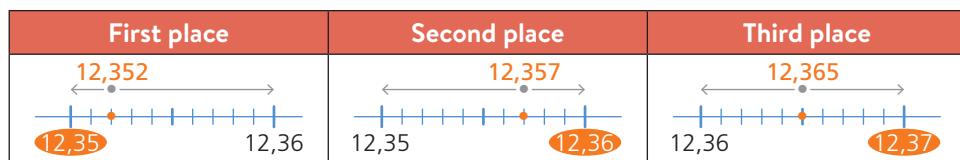
Rounding

The table shows the three best times from a 100 m race.

First place	Second place	Third place
12,352 s	12,357 s	12,365 s

The scorecard has space for just two decimal places, so the judges round to hundredths. What numbers will they write on the scorecard?

To find out, we round each number to two decimal places.



By rounding a number, we reduce the number of decimal places but maintain an approximate value. The result is less accurate, but easier to do calculations with.

To **round a number** to a specific number of decimal places, follow these steps.

- Decide which is the last place value digit to keep and draw a vertical line to the right of it. Look at the first digit to the right of your line.
- If it's 5 or more, increase the previous digit by 1. If it's 4 or less, keep the previous digit the same.
- Finally, remove all digits to the right of the line.

Truncating

Vanesa and her classmates have found different solutions to 27 : 16.

$$27 : 16 = 1,6875$$

All their answers are correct, because they're approximations made by truncating the quotient.

To **truncate a decimal number** to a specific number of places, we remove all digits after that number of decimal places, without rounding.

This produces a margin of error that's greater or equal to that produced when rounding.

1,6875	Rounding	Error	Truncating	Error
to 1 d.p.	1,7	0,0125	1,6	0,0875
to 2 d.p.	1,69	0,0025	1,68	0,0075
to 3 d.p.	1,688	0,0005	1,687	0,0005

Activities

- 37 In your notebook, round these numbers to 1 d.p.

a) 5,79	c) 12,935	e) 0,999
b) 43,62	d) 4,8135	f) 4,5551

- 38 Copy and complete the table.

	Rounded to 1 d.p.	Rounded to 2 d.p.	Rounded to 3 d.p.
9,8759			
0,3491			
2,3749			
5,9927			

- 39 Round to 2 d.p. and calculate the margin of error.

- a) 4,917 c) 0,781 e) 0,8972
 b) 3,753 d) 51,245 f) 12,1951

- 40 Copy and complete the numbers.

- a) 43, 25 rounded to 1 d.p. is 43,8.
 b) 35,7 rounded to 1 d.p. is 35,7.
 c) 0,8 64 rounded to 2 d.p. is 0,84.
 d) 4, 987 rounded to 2 d.p. is 5,00.

- 41 Truncate the numbers to 2 d.p. and to 3 d.p.

- a) 43,6834 d) 22,983211
 b) 3,9992 e) 0,95381
 c) 546,952 f) 56,6792

- 42 Copy and complete the table.

	Truncated to 1 d.p.	Truncated to 2 d.p.	Truncated to 3 d.p.
12,3092			
4,56667			
5,738			
4,99217			

Take note

It's easier to do calculations with approximate values when numbers have lots of decimal places.

- 43 Round each number to 1 decimal place, then add or subtract the rounded numbers. Then repeat, but this time do the calculation first, then round the answer to 1 decimal place.

- a) $3,357 + 4,29$ c) $43,082 - 21,952$
 b) $72,346 + 5,096$ d) $5,679 - 2,93$

What are the differences between the answers?

- 44 Calculate $3,452 \cdot 5,02$ in these different ways.

- a) Round each number to 1 d.p., then do the multiplication.
 b) Do the multiplication, then round the answer to 1 d.p.
 c) Truncate each number to 1 d.p., then do the multiplication.
 d) Do the multiplication, then truncate the answer to 1 d.p.

- 45 First round each number to 1 d.p. and then do the calculation

- a) $2,73 + 17,556$ c) $4,239 \cdot 5,0313$
 b) $90,398 - 7,099$ d) $20,4871 : 0,5073$

- 46 2,57 is a decimal number rounded to 2 d.p.

Which of these could be the original number?

- a) 2,578 c) 2,565 e) 2,563
 b) 2,569 d) 2,579 f) 2,571

- 47 Imagine you can't write decimal numbers on your calculator. How can you do these calculations?

- a) $39,05 \cdot 2$ b) $128,95 \cdot 5,1$ c) $1500 \cdot 5,5$

CLIL zone

- 48  Work with a classmate. Do the calculation below, and then round the result to 2 d.p. Then do it again, but this time round each number to 2 d.p. before you do the calculation. Compare your results.

$$3,265 + 2,3 \cdot 3,414$$

If we round the result, the answer is a number greater than/equal to/lower than if we round the values first.

If we round the result, the answer has more/fewer/the same number of decimal places than if...

If we round each number first, the answer will be more accurate/less accurate/just as accurate as/than if we round the answer instead.

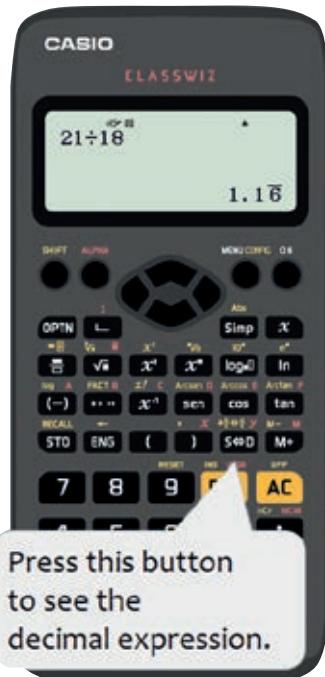
5 Decimal numbers and fractions

Converting an exact decimal number to a fraction

Take note

- 1 tenth $\rightarrow \frac{1}{10} = 0,1$
1 hundredth $\rightarrow \frac{1}{100} = 0,01$
1 thousandth $\rightarrow \frac{1}{1000} = 0,001$

Using a calculator



To convert 23,65 to a decimal fraction, we break it down as follows.

$$23,65 = 2 \cdot 10 + 3 \cdot 1 + 6 \cdot \frac{1}{10} + 5 \cdot \frac{1}{100} = \frac{2000}{100} + \frac{300}{100} + \frac{60}{100} + \frac{5}{100} = \frac{2365}{100}$$

All exact decimal numbers can be converted to fractions with denominators that have the same number of zeros as there are decimal places.

A **decimal fraction** is a fraction where the denominator is a power of ten, such as 10, 100, 1000, and so on.

Converting a fraction to a decimal number

To convert a fraction to a decimal, we divide the numerator by the denominator.

Fraction	$\frac{17}{4}$	$\frac{26}{11}$	$\frac{21}{18}$
Conversion to decimal	$\begin{array}{r} 1\ 7 \\ 1\ 0 \\ 2\ 0 \\ 0 \end{array} \left \begin{array}{l} 4 \\ 4,25 \end{array} \right.$	$\begin{array}{r} 2\ 6 \\ 4\ 0 \\ 7\ 0 \\ 4\ 0 \\ 7\ 0 \\ 4 \end{array} \left \begin{array}{l} 11 \\ 2,3636... \end{array} \right.$	$\begin{array}{r} 2\ 1 \\ 3\ 0 \\ 1\ 2\ 0 \\ 1\ 2\ 0 \\ 1\ 2 \end{array} \left \begin{array}{l} 18 \\ 1,166... \end{array} \right.$
Type of decimal	$\frac{17}{4} = 4,25$ Exact decimal	$\frac{26}{11} = 2,3636...$ Pure recurring decimal	$\frac{21}{18} = 1,166...$ Mixed recurring decimal
Parts of the number	integer decimal part 	integer recurring part 	whole number fixed part recurring

The decimal conversion of a fraction can be an exact decimal, a pure recurring decimal or a mixed recurring decimal.

Lost in translation

To show that part of a decimal number repeats indefinitely, draw an arc above the repeating decimals. For example, the arc over 45 in the number 7,45 shows that these two digits recur indefinitely. In English, a dot or dots are used for this:

71,45

6 Ordering decimal numbers

In the long jump, Ignacio jumped 4,78 m, Gonzalo jumped 3,98 m and Matías jumped 4,79 m. Who jumped the furthest?

To **put decimal numbers in order**, first we compare the whole numbers. If the whole numbers are the same, we compare the tenths. If they're the same too, we compare the hundredths, and so on, until two numbers of the same order are different.

This is the order of the long jumps:

$$4,79 > 4,78 > 3,98$$

Activities

- 49 In your notebook, convert these numbers to decimal fractions.

- a) 4,03 e) 4,2516
 b) 17,5 f) 0,08
 c) 12,003 g) 9,02005
 d) 1,23 h) 100,3

- 50 Copy and complete the equations.

a) $\frac{23}{\square} = 2,3$	d) $\frac{11}{\square} = 0,011$
b) $\frac{\square}{10} = 47,3$	e) $\frac{5}{\square} = 0,05$
c) $\frac{\square}{1000} = 12,5$	f) $\frac{\square}{100} = 33,45$

- 51 Write these fractions as decimal numbers. Decide if they're exact, pure recurring or mixed recurring.

a) $\frac{19}{6}$	e) $\frac{7}{12}$
b) $\frac{27}{4}$	d) $\frac{12}{11}$
c) $\frac{13}{3}$	f) $\frac{2}{27}$

- 52 Using mathematical notation symbols, write the abbreviations for these recurring decimals.

a) 4,3535...
b) 5,033131...
c) 12,03434...
d) 15,04891891...
e) 32,34703470...
f) 52,459459111

- 53 Rewrite these numbers to 4 decimal places.

- a) 2,5 e) $0,\overline{031}$
 b) $2,\overline{17}$ f) $17,\overline{35}$
 c) $1,\overline{02}$ g) $52,\overline{31}$
 d) $9,\overline{403}$ h) $72,\overline{3}$

- 54 What digit will be in the ten-thousandths place in these numbers?

- a) $3,\overline{23}$ d) $12,\overline{507}$
 b) $5,\overline{1}$ e) $12,\overline{34}$
 c) $1,\overline{345}$ f) $7,\overline{945}$

- 55 A number is rounded to hundredths. The result is 4,36. Which of these could be the original number?

- a) 4,367 c) $4,\overline{36}$
 b) $4,\overline{36}$ d) $4,\overline{3}$

Worked example

- 56 Put these numbers in order from largest to smallest.

$$\frac{3}{2}, \quad 1,\overline{51}, \quad 1,45, \quad \frac{13}{9}, \quad 1,4$$

Solution

Convert all the numbers to decimals.

$$\begin{array}{ll} \frac{3}{2} = 1,5 & 1,\overline{51} = 1,511\dots \\ 1,\overline{45} = 1,4545\dots & \frac{13}{9} = 1,444\dots \\ & 1,4 \end{array}$$

Order the decimals.

$$1,511\dots > 1,5 > 1,4545\dots > 1,444\dots > 1,4 \\ 1,\overline{51} > \frac{3}{2} > 1,45 > \frac{13}{9} > 1,4$$

- 57 Order these numbers from largest to smallest.

a) $\frac{2}{11}$	0,17	0,181	$\frac{1}{5}$
b) $\frac{23}{5}$	4,5	4,59	$\frac{14}{3}$
c) $\frac{2}{3}$	0,62	$\frac{5}{8}$	0,6
d) $0,4\overline{5}$	$\frac{4}{9}$	$\frac{3}{8}$	0,37

CLIL zone

- 58 Listen to the students deciding which is the smaller number in each of these pairs. Write their answer and decide if it's correct or incorrect.

- a) 5,2 and 5,18 c) 0,19 and 0,21 e) 1,23 and 2,23
 b) 3,009 and 3,01 d) 0,9 and 0,899 f) 43,09 and 43,019