



Rounding numbers to 10

You can use a number line to help work out whether to round a number up or down.

Let's look at rounding 44 to the nearest 10.

First put 44 on the number line, then add the closest multiples of ten.

40 and 50 are the closest multiples of ten to 44.



44 is 4 away from 40 and 6 away from 50.

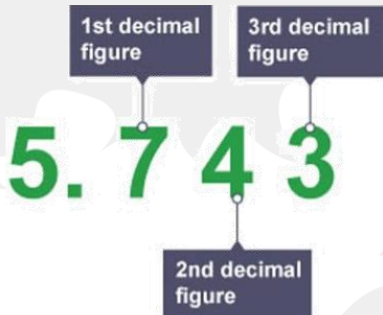
44 is closer to 40 and so it is rounded down to 40.



When numbers have a 5 in the ones column, you always round up to the highest ten.

Counting decimal places

Decimal places are counted from the decimal point:



So, the number 5.743 is said to have 3 decimal places. The number 5.1492 has four decimal places, while 4.34 has two decimal places.

Example

Round 9.6371 to 2 decimal places

This means we need 2 digits after the decimal point.

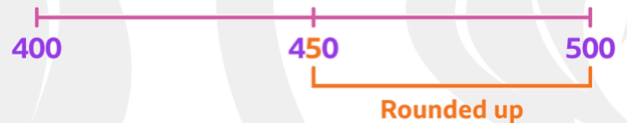


Since the next digit 7, is **more than 5**, we round the 3 up.
9.6371 = 9.64 (2 decimal places)

Rounding to 100 and 1,000

When rounding to the nearest 100, numbers with 50 in the tens column are rounded up to the next hundred.

For example, 450 would round up to 500. Numbers below 50 are rounded down.



When rounding to the nearest 1,000, numbers with 500 in the hundreds column are rounded up to the next thousand.

For example, 1,500 would round up to 2,000. Numbers below 500 are rounded down.



Significant figures

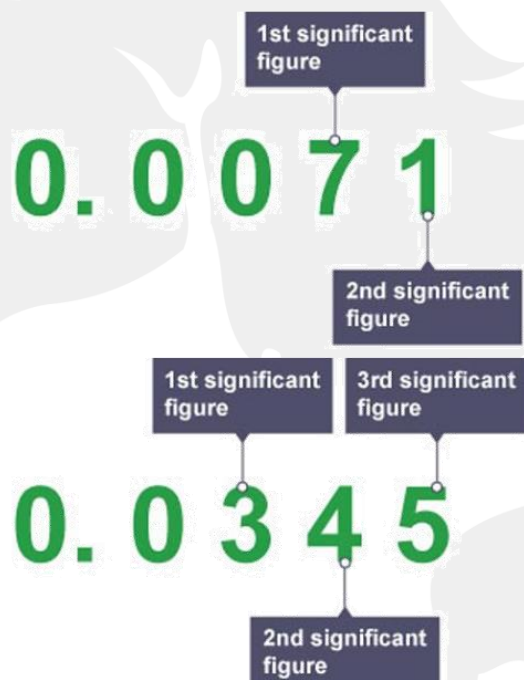
Another way of rounding numbers is to count only the first few digits (maybe 1, 2 or 3 figures) that have a value attached to them.

This method of rounding is called **significant figures** and it's often used with larger numbers, or very small numbers.

Counting significant figures

Significant figures start at the **first non-zero number**, so ignore the front, but not the ones in between.

Look at the following examples:



Converting fractions to decimals

To convert a fraction to a decimal, you need to use **written division methods** to divide the numerator by the denominator.

Example

Convert $\frac{3}{8}$ into a decimal.

Divide 3 by 8.

8 is bigger than 3, so the division will go into **decimal places**. Make sure you keep the decimal points in line. Placeholder zeros will help you complete the calculation.

0. 3 7 5
8 | 3. 0 0 0
 3 6 4

Frequency Trees

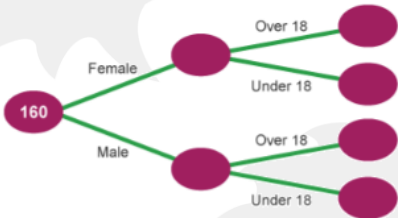
A frequency tree can be used to record and organise information given as frequencies. This can then be used to calculate probabilities.

Example

A running club has 160 members. 74 of the club members are female. 58 of the female members are over 18. 21 of the male club members are under 1

Complete the frequency tree to show this information.

Find the probability that a member of the club chosen at random is und

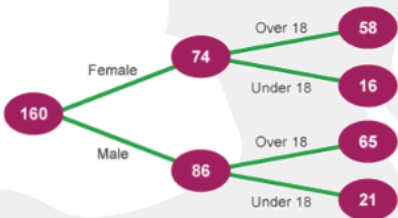


Since 74 members are female, $160 - 74 = 86$ members must be male.

58 female members are over 18, so $74 - 58 = 16$ females are under 18.

21 male members are under 18, so $86 - 21 = 65$ males are over 18.

Adding this information to the frequency tree gives:



The total number of under 18s is $16 + 21 = 37$, so the probability that a member of the club chosen at random is under 18 is $\frac{37}{160}$.

Converting percentages to decimals and fractions

To convert from a percentage, first convert it to a decimal and then convert the decimal to a fraction if required.

Example

Convert 24% to a decimal and a fraction.

24% = 0.24 (2 tenths and 4 hundredths)

Hundreds	Tens	Units	.	Tenths	Hundredths	Thousandths
		0	.	2	4	

0.24 as a fraction is $\frac{24}{100}$ which simplifies to $\frac{6}{25}$ (simplified by removing a common factor of 4).

How to interpret timetables

Timetables are lists of times that present information about when something will happen.

They can also tell you how long something will take. This is also known as its duration.

When you read timetables, you often need to read across the rows and down the columns of the table.



Bus timetable					
Rain Rd	06:50		07:25	08:45	09:10
Long Rd	07:00	07:25	07:41	08:55	09:19
Westland Rd	07:11	07:41	07:51	09:04	09:28
Eastern Drive	07:18	07:59	07:59		09:38

On this bus timetable, each row shows the arrival times of a bus at different stops.

So reading across a row tells you the different times when a bus reaches that stop throughout the day.

Calculating durations using a timetable

On this part of a bus timetable, the buses leave Thornton Interchange every 15 minutes. However, some of the buses take longer than others to get back to Thornton Interchange.

Bus timetable					
Thornton Interchange	06:00	06:15	06:30	06:45	07:00
Main Road	06:10	06:25	06:45	07:00	07:10
Crossley Street	06:18	06:33			07:18
Western Drive	06:25	06:40	06:57	07:12	07:25
Thornton Drive	06:32	06:47	07:04	07:19	07:32
Saltwell Common	06:40	06:55	07:12	07:27	07:40
Legrams Lane	06:48	07:03			07:48
Thornton Interchange	07:05	07:20	07:28	07:43	08:05

Two of the buses on the timetable do not stop at every stop, so they have a shorter journey time.

You can calculate the duration of the 06:30 bus journey, from Thornton Interchange back to Thornton Interchange, by working out the difference in time between the departure time and the arrival time.

You can see the bus departs at 06:30 and arrives at 07:28.

You might use a number line to find the difference between these times or you might count on in your head.