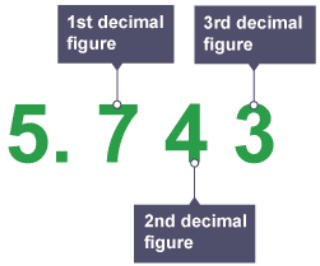
S2 Rounding and Estimation

Rounding to a given number of places

Counting decimal places

Decimal places are counted from the decimal point:



So, the number 5.1492 has four decimal places, while 4.34 has two decimal places.

To round a number to a given number of decimal places, look at the number in the next decimal place:

- If it's less than 5, round down
- If it's 5 or more, round up

Example

Round 9.6371 to 2 decimal places

This means we need 2 digits after the decimal point.

Because the next digit 7, is more than 5, we round the 3 up.

$9.6371 = 9.64$ (2 decimal places)

Question

Q1. Round 7.2648 to 2 decimal places.

Q2. Round 8.352 to 1 decimal place.

A1.

To round to two decimal places, look at the number in the third decimal place. It's a 4, so round down.

Therefore, $7.2648 = 7.26$ (2 decimal places)

A2.

To round to one decimal place, look at the number in the second decimal place. It's a 5, so round up.

Therefore, $8.352 = 8.4$ (1 decimal place)

Making estimates

Rounding prices

Imagine that you are buying a T-shirt for £9.99, a pair of socks for £1.49 and a belt for £8.99. The cashier charges you £23.47. You feel that this is too much - but how do you know?

One way of finding out whether you have been over-charged is to estimate what the total amount should be. Round the different prices into easier numbers - £9.99 is approximately £10, £1.49 is approximately £1.50 and £8.99 is approximately £9 - and you can do the calculation quickly in your head.

$£9.99 + £1.49 + £8.99 \approx £10 + £1.50 + £9 = £20.50$

This is almost £3 less than the cashier asked for, so obviously you have been over-charged.

The symbol ≈ means 'approximately equal to'.

Examples

By rounding the actual values to more manageable numbers, you can estimate the answers to many problems:

$£2.99 + £3.10 + 99p \approx £3 + £3 + £1 = £7$

$29 \times 9 \approx 30 \times 10 = 300$

$61 \div 6 \approx 60 \div 6 = 10$