

Rounding

Starter

1. **(Review of Y7 material)** Round 72.985 to: (a) 1 d.p. (b) 2 d.p.
N.B. Click [here](#) for a reminder on rounding to a specified number of decimal places

Working: (a) Locate the digit in the 1st decimal place i.e. 9
Imagine a dotted line between the 9 and the next digit (the 8).
Is the 8 strong enough to move the 9 up? Yes, it is.
The 9 goes up to a 0 which cause the 2 to go up to a 3
Answer is 73.0

(b) Locate the digit in the 2nd decimal place i.e. 8
Imagine a dotted line between the 8 and the next digit (the 5).
Is the 5 strong enough to move the 9 up? Yes, it is.
The 8 goes up to a 9 which cause the 2 to go up to a 3
Answer is 72.99

N.B. The abbreviation **i.e.** is short for "id est" which is Latin for "that is" or "in other words".

2. **(Review of Y7 material)** An answer has been given as 3.10. Has it been rounded to 1 d.p. or 2 d.p.?

Working: 2 d.p. because there are two digits after the decimal point.

E.g. 1 Identify the 1st and 2nd significant figures for: (a) 608.57 (b) 0.040780

Working: (a) 608.57 1st significant figure is 6
2nd significant figure is 0

(b) 0.040780 1st significant figure is 4
2nd significant figure is 0

E.g. 2 Round these numbers to 1 s.f.: (a) 73981 (b) 0.73981 (c) 739.81

Working: (a) 1 s.f. so draw a dotted line to the right of the 1st s.f.: 7 : 3981
Look at the digit to the right of the dotted line: 3
Does the 3 cause the 7 to round up? No, so 7 stays as it is.
The digits to the right of the dotted line become zeros because they are before the decimal point
73981 becomes 70000

(b) 1 s.f. so draw a dotted line to the right of the 1st s.f.: 0.7 : 3981
Look at the digit to the right of the dotted line: 3
Does the 3 cause the 7 to round up? No, so 7 stays as it is.
The digits to the right of the dotted line disappear because they are after the decimal point.
0.73981 becomes 0.7

- (c) 1 s.f. so draw a dotted line to the right of the 1st s.f.: 7 : 39.81
Look at the digit to the right of the dotted line: 3
Does the 3 cause the 7 to round up? No, so 7 stays as it is.
The digits to the right of the dotted line and before the decimal point become zeros; the digits to the right of the dotted line and after the decimal point disappear.
739.81 becomes 700

Remember Non-significant digits *before* the decimal point → *zeros*.
Non-significant digits *after* the decimal point → *disappear*.

E.g. 3 Discuss with a partner whether the following are true or false:

- (a) 0.0059283 rounded to 4 s.f. is 0.0059
(b) 764 rounded to 2 s.f. is 76
(c) 0.004037 rounded to 2 sf is 0.00403
(d) A zero after the first non-zero digit is a significant figure.

Give reasons for your answer.

- Working:**
- (a) False, the answer should be 0.005928 — 0.0059 is to 2 s.f. since zeros cannot be the first significant figure.
- (b) False, the answer should be 760 — the 4 should have been turned into 0 because it is before the decimal point
- (c) False, the answer should be 0.40 — after the first non-zero digit, zeros are counted as significant figures.
- (d) True

E.g. 4 Round: (a) 0.01642 to 2 s.f. (b) 98137 to 4 s.f. (c) 0.0400923 to 3 sf

- Working:**
- (a) 2 s.f. so draw a dotted line to the right of the 2nd s.f.: 0.016 : 42
Look at the digit to the right of the dotted line: 4
Does the 4 cause the 6 to round up? No, so 4 stays as it is.
The digits to the right of the dotted line disappear because they are after the decimal point.
0.01642 becomes 0.016
- (b) 4 s.f. so draw a dotted line to the right of the 4th s.f.: 9813 : 7
Look at the digit to the right of the dotted line: 7
Does the 7 cause the 3 to round up? Yes, so 3 becomes 4.
The digit to the right of the dotted line and becomes a zero because it is before the decimal point.
98137 becomes 98140
- (c) 3 s.f. so draw a dotted line to the right of the 3rd s.f.: 0.0400 : 923
Look at the digit to the right of the dotted line: 9
Does the 9 cause the 0 to round up? Yes, so 0 becomes 1.
The digits to the right of the dotted line disappear because they are after the decimal point.
0.0400923 becomes 0.0401

E.g. 5 Complete these statements:

- (a) Rounding 39.285 to 1 d.p. is the same as rounding to ...
- (b) Rounding 1.5794 to 3 s.f. is the same as rounding to ...
- (c) Rounding 1543 to 2 s.f. is the same as rounding to ...

Working:

- (a) 3 significant figures
- (b) 2 decimal places
- (c) the nearest hundred

Video: [Rounding - decimals places](#)
Video: [Rounding - significant figures](#)

[Solutions to Starter and E.g.s](#)

Exercise

p72 Ex 4.5 Qu 1-4, 6 decimal places

p72 Ex 4.5 Qu 5, 7-10 significant figures

[Textbook answers \(only available during a lockdown\)](#)