

Rounding to Decimal Places

Starter

- Write these numbers in ascending order: 28, 22, 27, 24, 25
 - Write down which numbers are closer to 20 and which are closer to 30?

- Write these numbers in ascending order: 4.78, 4.73, 4.713, 4.782, 4.75
 - Write down which numbers are closer to 4.7 and which are closer to 4.8?

- The UK population in 2024 was 67,929,118.

 - Write this number in words.
 - When stating the population of the UK, is it always a good idea to give the exact number? Give reasons for your answer.
 - What would be a suitable estimation?

- Write down the mathematical symbol for 'less than'.
 - Write down the mathematical symbol for 'greater than or equal to'.

Notes

Inequality notation:	$<$ less than	$>$ more than
	\leq less than or equal to	\geq more than or equal to

What is rounding?

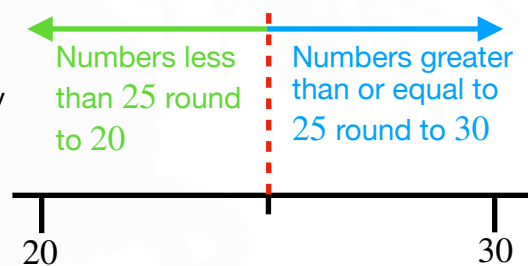
Rounding is useful when the full accuracy of the number is not required. It is also useful when estimating.

Rounding is about choosing the closest number according to the required degree of accuracy.

From question 1 of the starter, if 22 was rounded to the nearest 10 it would round to 20. Similarly with 24. However, if 27 and 28 are rounded to the nearest 10, they would round to 30.

The issue is 25. In maths, we decided that **numbers in the middle round up**.

Therefore, 25 rounded to the nearest 10 is 30.



- E.g. 1**
- A number lies between 300 and 400. Write down an inequality for numbers which:

 - round to 300
 - round to 400
 - A number, x , rounded to the nearest 100 becomes 300. Write down an inequality to show the range of values which x could take.
 - A number, y , rounded to the nearest 100 becomes 2700. Write down an inequality to show the range of values which y could take.

- Working:**
- < 350
 - ≥ 350
 - $250 \leq x < 350$
 - $2650 \leq y < 2750$

Key digit

Let's call the digit which decides whether a number rounds up or not the **key digit**.

- E.g. 2** (a) When rounding 74.2 to the nearest 10, which is the key digit?
(b) State the key digit of 8351 when rounding it the nearest 100.
(c) Copy and complete these sentences:
(i) When rounding to the nearest 10 the key digit is the ____ digit.
(ii) When rounding to the nearest 100 the key digit is the ____ digit.
(iii) When rounding to the nearest 1000 the key digit is the ____ digit.
(d) Write a sentence explaining how to round a number. Use the words **key digit** in your explanation.

Working: (a) The key digit is the 4.

When rounding to the nearest 10 the key digit is the units digit.
When rounding to the nearest 100 the key digit is the 10s digit etc.

Rule for rounding

If the **key digit is 5 or more, round up**. Otherwise do not.

E.g. 3 Round these number to the nearest 10.

- (a) 138 (b) 1907 (c) 82.5

Working: (a) 140

E.g. 4 Round these number to the nearest 100.

- (a) 545 (b) 60441 (c) 48

Working: (a) 500

E.g. 5 Round these number to the nearest 1000.

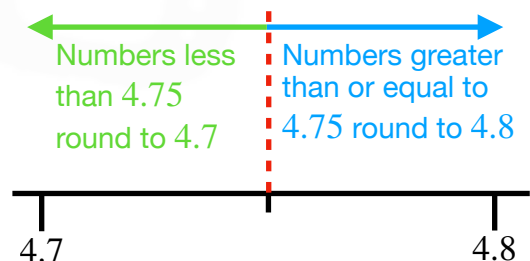
- (a) 40824 (b) 454545 (c) 899499

Working: (a) 41000

Decimal places

This is the diagram for question 2 of the starter.

Again, it has been decided that the **middle number rounds up**.



- E.g. 6** (a) A number, p , rounded to one decimal place becomes 16.3. Write down an inequality to show the range of values which p could take.
(b) A number, q , rounded to two decimal places becomes 2.89. Write down an inequality to show the range of values which q could take.

Working: (a) $16.25 \leq p < 16.35$

- E.g. 7** (a) When rounding to 1 decimal place, which is the **key digit**?
(b) Write down an explanation for how to round to 1 decimal place.
(c) How does it change when rounding to 2 decimal places.

Working: (a) The key digit is the digit in the second decimal place

When **rounding to one decimal place**, if the **digit in the second decimal place is 5 or greater**, **round** the digit in the first decimal place **up**.

- E.g. 8** (a) Round these numbers to one decimal place.
(i) 3.781 (ii) 0.1492 (iii) 79.95
(a) Round these numbers to two decimal places.
(i) 29.3251 (ii) 1.6419 (iii) 0.00492

Working: (a) (i) 3.8 ...
(b) (i) 29.33 ...

- E.g. 9** Bill is asked to round the number 15.248 to 2 decimal places and says 15.25. He is then asked to round 15.248 to 1 decimal places and says 15.3. Is Bill correct? Explain your answer.

Rounding to the nearest integer and the nearest 5

An **integer** is the mathematical name for a **whole number**.

- E.g.10** Round these numbers to the nearest integer.
(a) 68.4 (b) 902.6 (c) 284.4999 (d) 583.05

Working: (a) 68

- E.g.11** Round these numbers to the nearest 5.
(a) 43 (b) 78 (c) 1739 (d) 4392.8

Working: (a) 45

When rounding to the nearest 5, think about which is the next multiple of 5 up or down — which could be a 10.

Video: [Rounding - decimals places](#)

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

Exercise

CIMT 7A p27 Ex 2.2 Qu 2-5 decimal places
CIMT 8A p72 Ex 4.5 Qu 1-4, 6 decimal places
See below

Exercise

- Round these numbers to the nearest 10.
(a) 46 (b) 99 (c) 175 (d) 298891
- Round these numbers to the nearest 100.
(a) 384 (b) 607 (c) 951 (d) 87449
- Round these numbers to the nearest 5.
(a) 82 (b) 15927 (c) 197.5 (d) 9374983
- Round these numbers to the required degree of accuracy:
(a) 98563 to the nearest 10 (b) 1004292 to the nearest 1000
(c) 2.48 to the nearest 5 (d) 81.65 to the nearest integer
- Round these numbers to one decimal place.
(a) 6.84 (b) 7.539 (c) 43.2828 (d) 7.953
- Round these numbers to two decimal places.
(a) 1.7383 (b) 98.3649 (c) 0.00713 (d) 73.999
- Round these numbers to the required accuracy.
(a) 36.67032 to two decimal places (b) 0.365 to one decimal place
(c) 2.0389374 to one decimal place (d) 2.3695494 to three decimal places

Answers

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

Summary

The **key digit** is the digit which decides whether a number rounds up or not.

If the key digit is 5 or more, round up. Otherwise do not.

When rounding to the nearest 10, the key digit is the units digit.

When rounding to the nearest 100, the key digit is the 10s digit etc.

When **rounding to one decimal place**, if the **digit in the second decimal place is 5 or greater**, **round** the digit in the first decimal place **up**.