



17 - Checking and rounding

Rounding to...

10, 100 & 1000

Remember to keep the place value of each number by insert zeros where applicable.

Look at the number which **represents the place value**, look to the **right**, if this digit is **5 or more** the number **rounds up by 1**.

If the number is **4 or less** the number **stays the same**.

E.g. Round **17 839** to the nearest 10, 100 & 1000

- (i) Nearest 10 – 17 840
- (ii) Nearest 100 – 17 800
- (iii) Nearest 1000 – 18 000

Decimal places (d.p.)

1. **Identify the position** of the decimal place to be rounded to, e.g. 2d.p. would be the 2nd digit after the decimal place.
2. Then look to the **right** of this digit, this is called the **decider**, this number now decides whether the decimal place is rounded up or kept the same.
3. If the **decider** is **5 or more** then **round the digit up**.
4. If the **decider** is **4 or less** then **leave the digit as it is**.

Significant figures (s.f.)

1. The **first significant number** is the first digit of a number which isn't zero.
2. The **2nd, 3rd, digits** follow immediately after the 1st, regardless of zeros.



3. When rounding numbers the **place value** of each digit must be the same.

Estimating

When estimating you are **not guessing** you are making the numbers 'easier' for you to work out the sum.

To estimate a sum, you need to

1. Round each number to **1s.f.**
2. Then calculate the sum using the **hierarchy of operations**.

Example 1:

$$\text{Estimate } \frac{29.91 \times 38.3}{3.1 \times 3.9}$$

- Round to 1s.f.

$$\frac{30 \times 40}{3 \times 4} = \frac{1200}{12} = 100.$$

Example 2:

$$\text{Estimate } \frac{23.43 \times 4.3}{0.483}$$

- Round to 1s.f.

$$\frac{20 \times 4}{0.5} = \frac{80}{0.5} = 160$$

EXAMPLE: What is 7.45839 to 2 decimal places?

$$7.4\mathbf{5}839 = 7.46$$

LAST DIGIT DECIDER The LAST DIGIT rounds UP because the DECIDER is 5 or more.

Special case:

Round 23.999 to 2d.p. = 24.00

As the 3rd 9 rounds up the 2nd 9 which rounds up the 1st 9 due to the 9 turning into a '10' and insert zeros.

EXAMPLES:

	to 3 s.f.	to 2 s.f.	to 1 s.f.
1) 54.7651	54.8	55	50
2) 0.0045902	0.00459	0.0046	0.005
3) 30895.4	30900	31000	30000

Estimating square roots

- 1) Find the two consecutive square numbers either side.

E.g. $\sqrt{48}$

The two consecutive square numbers are 36 and 49.

- 2) Find the **square roots** of these two numbers: $\sqrt{36} = 6$ and $\sqrt{49} = 7$.

Therefore the estimate of $\sqrt{48}$ would be between 6 & 7.

This can then lead onto estimating the value, as 48 is close to 49, I would estimate that $\sqrt{48} = 6.9$

Linked Prior Topics:

- Place value

Vocabulary:

- Significant figures
- Decimal places

- Estimate
- Decider
- Consecutive

Linked Future Topics:

- Rounding answers e.g. area of a circle