Significant Figures

Quick revision notes

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Name: _____

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At a glance

Decimal places, significant figures, estimating, and how accurate an answer should be.

1. Rounding to decimal places
2. Rounding to significant figures
3. Estimating a calculation
4. Choosing a sensible accuracy

1. Rounding to decimal places

I revised this

- Count the places after the decimal point, then look at the **next** digit.
- 5 or more → round up; 4 or less → leave the digit.
- Keep the trailing zero if the question asks for it: 2.497 to 2 d.p. is 2.50, not 2.5.

Worked example

Round 3.14159 to 2 decimal places.

1. Two places: 3.14|159.
2. The next digit is 1 → stays.

3.14

2. Rounding to significant figures

I revised this

- The **first significant figure** is the first non-zero digit.
- Zeros at the start of a decimal never count: 0.004682 → first s.f. is 4.
- Zeros between non-zero digits do count: 3005 has 4 s.f.
- Keep the size of the number with place-value zeros: 68 451 to 3 s.f. = 68 500.

Number	1 s.f.	2 s.f.	3 s.f.
68 451	70 000	68 000	68 500
0.004682	0.005	0.0047	0.00468
2.0496	2	2.0	2.05

Worked example

Round 0.004682 to 2 significant figures.

1. First s.f. is the 4; two s.f. = 0.0046|82.
2. Next digit 8 → round up.

0.0047

3. Estimating a calculation

I revised this

- Round **every** number to 1 significant figure, then work it out without a calculator.
- Show the rounded numbers — the method mark is for them.
- Dividing by a decimal: 200 ÷ 0.2 = 2000 ÷ 2 = 1000.
- Overestimate or underestimate? If you rounded the numbers you multiply up, the estimate is too big.

How to do it

1. Round each number to 1 s.f.
2. Write the new calculation down.
3. Work it out (simplify fractions first).

Worked example

Estimate $(38.7 \times 5.12) \div 0.198$.

1. Round: $40 \times 5 \div 0.2$.
2. $40 \times 5 = 200$.
3. $200 \div 0.2 = 1000$.

1000

Exam tip: A square root estimate: round to the nearest square number, e.g. $\sqrt{48.6} \approx \sqrt{49} = 7$.

4. Choosing a sensible accuracy

☐ I revised this

- Unless the question says otherwise, give answers to **3 significant figures** (or exact).
- Angles in degrees: 1 decimal place. Money: to the nearest cent.
- Never round in the middle of a calculation — keep the full calculator value and round only the final answer.
- If the answer is exact (like 7.25), write it in full rather than rounding it.

Worked example

A rectangle is 3.47 m by 2.6 m. Find its area to a sensible accuracy.

1. $3.47 \times 2.6 = 9.022$.
2. Round to 3 s.f.

9.02 m²

Common mistakes

Don't write	Write instead
✗ 68 451 to 3 s.f. = 685	✓ Keep the place-value zeros: 68 500
✗ 0.004682 to 2 s.f. = 0.00	✓ Start counting at the first non-zero digit: 0.0047
✗ Rounding halfway through a calculation	✓ Keep full values; round at the end
✗ Estimating with the exact numbers	✓ Round each number to 1 s.f. first and show it

In the exam

- Write the full calculator answer down before you round it — it can earn a mark if your rounding slips.
- If the question says 'to 2 d.p.' give exactly 2 decimal places, including a final zero.
- An answer to 3 s.f. is the Cambridge default: 2.71828 → 2.72.

My notes