

THE ROUNDING RULE

- Find the place you are rounding **to**.
- Look at the digit **just after** it — the **deciding digit**.
- 5 or more** → round **up**. **Less than 5** → stay the same.
- Digits after become **zeros** (whole numbers) or are **dropped** (after the point).

WHY 347 ROUNDS TO 350



347 is past the halfway point 345, so it rounds **up**.

NEAREST MULTIPLE

- 347 to nearest **10** = **350**
 347 to nearest **100** = **300**
 3472 to nearest **1000** = **3000**
 2847 to nearest **100** = **2800**
 65 to nearest **10** = **70** — exactly 5 rounds **up**.

DECIMAL PLACES (D.P.)

Count places **after the point**; look at the next digit.

- 3.6472 to **1 d.p.** = **3.6**
 3.6472 to **2 d.p.** = **3.65**
 3.6472 to **3 d.p.** = **3.647**
 0.0839 to **2 d.p.** = **0.08**

KEEP THE FINAL ZERO

- 2.398 to **2 d.p.** = **2.40** — **not** 2.4.
- The question asked for **2** decimal places, so **2** must be written.

ROUNDING UP THROUGH A 9

- 9 becomes 10, so **carry** into the next column.
 3.97 to **1 d.p.** = **4.0**
 0.699 to **2 d.p.** = **0.70**
 2996 to nearest **10** = **3000**

SIGNIFICANT FIGURES (S.F.)

The **1st s.f.** is the first **non-zero** digit.

- 34 627 to **2 s.f.** = **35 000**
 34 627 to **1 s.f.** = **30 000**
 0.004 82 to **2 s.f.** = **0.0048**
 5097 to **3 s.f.** = **5100**

WHICH ZEROS COUNT?

- Zeros **in front** never count: in 0.00482 the **4** is the 1st s.f.
- Zeros **between** digits **do** count: in 5097 the digits are 5, 0, 9.

PLACE-HOLDERS KEEP THE SIZE

- 34 627 to 2 s.f. is **35 000**, **not** 35.
- Without the zeros the number would be far too small.

⚠ COMMON EXAM MISTAKES (recurring errors flagged in examiners' reports)

- ✗ **Truncating** (chopping off) instead of rounding.
- ✗ Rounding **one digit at a time** instead of looking at a single deciding digit.
- ✗ Dropping **place-holder zeros**, so 34 627 to 2 s.f. becomes 35 not 35 000.
- ✗ 2.398 to 2 d.p. given as 2.4 — it must be 2.40.
- ✗ Rounding the wrong number of digits for the required accuracy.

LENGTH

10 mm	= 1 cm
100 cm	= 1 m
1000 m	= 1 km

MASS

1000 mg	= 1 g
1000 g	= 1 kg
1000 kg	= 1 tonne

THE LENGTH LADDER



Going **right** to a bigger unit → **divide**. Going **left** to a smaller unit → **multiply**.

CAPACITY

10 ml	= 1 cl
100 cl	= 1 litre
1000 ml	= 1 litre

TIME

60 sec	= 1 minute
60 min	= 1 hour
24 hours	= 1 day
7 days	= 1 week
52 weeks	= 1 year
365 days	= 1 year

⚠ TIME IS NOT METRIC

- Time goes up in **60s**, not 10s or 100s.
- 2.5 hours = **2 h 30 min** — **not** 2 h 50 min.
- 1.25 hours = **1 h 15 min**.
- 90 min = **1 h 30 min** = 1.5 hours.

CONVERTING BETWEEN UNITS

- Bigger unit → smaller unit: **multiply**.
3.5 m = 350 cm.
- Smaller unit → bigger unit: **divide**.
2500 g = 2.5 kg.
- 4 km = 4000 m, 750 ml = 0.75 litres.

WHICH WAY?

- Going to a **smaller** unit gives **more** of them (multiply).
- Going to a **bigger** unit gives **fewer** (divide).
- Check:** does your answer look sensible in size?

WORKED CONVERSIONS

6.2 cm → mm ($\times 10$) = **62 mm**

1450 m → km ($\div 1000$) = **1.45 km**

0.8 kg → g ($\times 1000$) = **800 g**

325 ml → litres ($\div 1000$) = **0.325 l**

TWO STEPS AT ONCE

- To go **mm** → **m**: $\div 10$ then $\div 100$ (same as $\div 1000$).
- 4500 mm = 450 cm = **4.5 m**.

⚠ COMMON EXAM MISTAKES (recurring errors flagged in examiners' reports)

✗ **Converting the wrong way** (multiplying when you should divide, or vice versa).

✗ Using the **wrong factor** — e.g. 100 cm in a metre, not 10.

✗ **Mixing units** in one calculation without converting first.

✗ Forgetting **1 tonne = 1000 kg** and **1 litre = 1000 ml**.

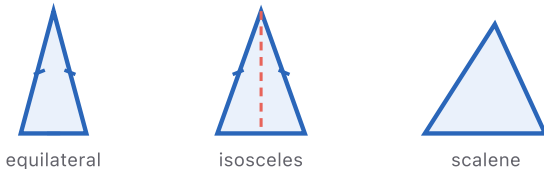
NAMES OF POLYGONS (BY SIDES)

3	Triangle	7	Heptagon
4	Quadrilateral	8	Octagon
5	Pentagon	9	Nonagon
6	Hexagon	10	Decagon

TRIANGLES

- **Equilateral:** 3 equal sides, 3 angles of 60° . 3 lines of symmetry.
- **Isosceles:** 2 equal sides, 2 equal base angles. 1 line of symmetry.
- **Scalene:** all sides and angles different. 0 lines.
- **Right-angled:** one 90° angle.

MARKING EQUAL SIDES & ANGLES



Dashes mark equal sides. The **dashed line** is a line of symmetry.

THE TWO KINDS OF SYMMETRY

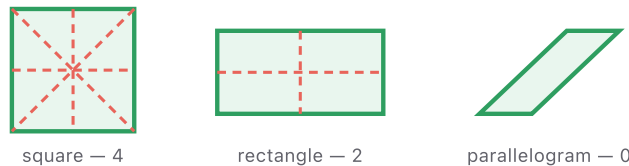
- **Lines of symmetry** — how many **mirror lines**: the shape folds exactly onto itself.
- **Order of rotational symmetry** — how many times it looks the **same in a full turn**.
- Order **1** means **no** rotational symmetry.

SYMMETRY SUMMARY

Shape	Lines	Order
Square	4	4
Rectangle	2	2
Equilateral triangle	3	3
Isosceles triangle	1	1
Parallelogram	0	2
Rhombus	2	2
Regular hexagon	6	6
Circle	infinite	infinite

A **parallelogram** has **no** lines but order **2**.

LINES OF SYMMETRY



A parallelogram has **no** lines of symmetry — but rotational order **2**.

QUADRILATERALS

- **Square:** 4 equal sides, 4 right angles.
- **Rectangle:** opposite sides equal, 4 right angles.
- **Parallelogram:** 2 pairs of parallel sides, opposite angles equal.
- **Rhombus:** 4 equal sides, opposite angles equal.
- **Trapezium:** exactly **one** pair of parallel sides.
- **Kite:** 2 pairs of adjacent equal sides.

REGULAR POLYGONS

- **Regular** = all sides equal **and** all angles equal.
- A regular polygon with **n** sides has **n** lines of symmetry and rotational order **n**.

⚠ COMMON EXAM MISTAKES (recurring errors flagged in examiners' reports)

✗ **Confusing line and rotational symmetry.**

✗ Saying a **parallelogram** has **2 lines of symmetry** — it has **0** (but order 2 rotational).

✗ Miscounting lines of symmetry on regular polygons.

✗ Assuming a trapezium has 2 pairs of parallel sides (it has **one**).

✗ Calling any 4-sided shape a "square".

PERIMETER VS AREA

- **Perimeter** = distance **around** the edge — add all the sides. Units: cm, m.
- **Area** = space **inside** — measured in **square** units: cm^2 , m^2 .
- On a grid, count the unit lengths (perimeter) or unit squares (area).

ALWAYS USE PERPENDICULAR HEIGHT

- For a parallelogram, triangle or trapezium use the **perpendicular height** (straight across), **not** the slant side.
- The height must make a **right angle** with the base.

PERIMETER EXAMPLES

Rectangle 7 by 3: $7+3+7+3 = 20 \text{ cm}$

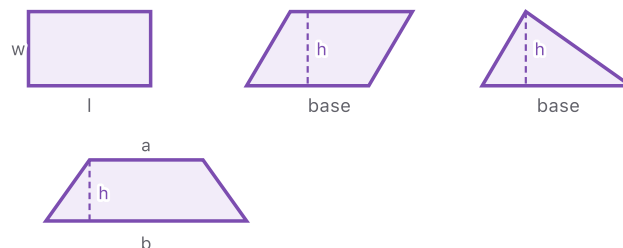
Square side 9: $4 \times 9 = 36 \text{ cm}$

Triangle sides 5, 6, 7: **18 cm**

UNITS TO USE

- **Perimeter** is a length $\rightarrow$ mm, cm, m, km.
- **Area** is a square measure $\rightarrow$ mm^2 , cm^2 , m^2 .
- Make all lengths the **same unit** before calculating.

AREA FORMULAS



Rectangle	$A = \text{length} \times \text{width}$
Parallelogram	$A = \text{base} \times \text{height}$
Triangle	$A = \frac{\text{base} \times \text{height}}{2}$
Trapezium	$A = \frac{a + b}{2} \times h$

WORKED EXAMPLES

Rectangle 6×4 : area = **24 cm^2** , perimeter = **20 cm** .

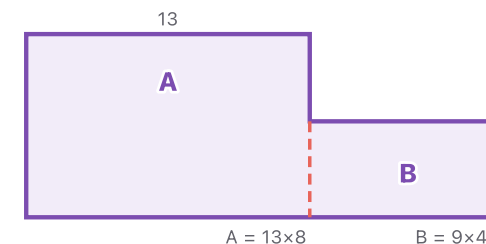
Triangle base 6, height 8: $\frac{6 \times 8}{2} = \mathbf{24 \text{ cm}^2}$

Trapezium parallel sides 8 & 9, height 6:
 $(8+9) \div 2 \times 6 = \mathbf{51 \text{ cm}^2}$

COMPOUND SHAPES

- **Split** the shape into rectangles / triangles.
- Find each area, then **add** them (or subtract a missing piece).
- Find missing lengths from the sides you are given.

SPLITTING A COMPOUND SHAPE



Split along the **dashed line**, then **add**: $104 + 36 = \mathbf{140}$.

PERIMETER OF COMPOUND SHAPES

- Go **all the way round** the outside — the split line is **not** part of the perimeter.
- Work out any **missing sides** first by comparing opposite sides.

⚠ COMMON EXAM MISTAKES (recurring errors flagged in examiners' reports)

✗ **Confusing area and perimeter.**

✗ Using the **slant side** instead of the **perpendicular height**.

✗ Forgetting to $\div 2$ for a triangle.

✗ Trapezium: forgetting to **add the parallel sides and halve** before $\times$ height.

✗ Wrong units — area is cm^2 , perimeter is cm.