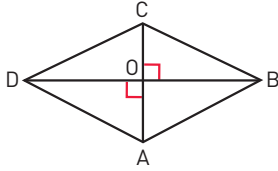> **YOU & MATHS** **Rhombus and trapezium** In a rhombus one diagonal is 8 cm long and the other diagonal is 14 cm long. A trapezium has twice the area of the rhombus, and the altitude of the trapezium is 16 cm. Find the sum of the lengths of the bases of the trapezium.

Let us draw a rhombus that has $DB = 14$ cm and $AC = 8$ cm.

The rhombus is equivalent to the sum of two congruent triangles:

$$ABCD \doteq DBC + DBA.$$

So the area of the rhombus is given by:

$$\text{area} = \frac{1}{2} \cdot \overline{DB} \cdot \overline{OC} + \frac{1}{2} \cdot \overline{DB} \cdot \overline{OA} = \frac{1}{2} \overline{DB} \cdot \overline{AC} = \frac{1}{2} \cdot 14 \cdot 8 = 56,$$

so the area measures 56 cm².
We know that the area of a trapezium is given by:

$$\text{area} = \frac{S \cdot h}{2},$$

where S is the sum of the lengths of the two bases and h is the altitude. We know by hypothesis that the area of the trapezium is twice the area of the rhombus:

$$\text{area} = 2 \cdot 56 = 112,$$

so the area is 112 cm².
We know that $h = 16$ cm, so:

$$112 = \frac{S \cdot 16}{2}.$$

Finally, the sum of the lengths of the two bases, in centimetres, is:

$$S = \frac{2 \cdot 112}{16} = 14.$$