

**SHQ: How do I recognize and calculate vertically opposite angles?**

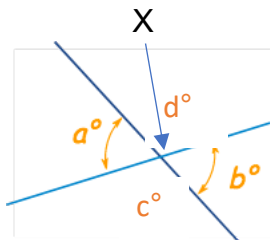
To help answer the Power Maths problems in this lesson, you will need to know a few facts about angles and straight lines.

Use this 'Maths is Fun' link to explore 'vertically opposite' angles, to create some of your own, and to identify pairs of vertically opposite angles:

<https://www.mathsisfun.com/geometry/vertically-opposite-angles.html>

**In summary:**

Vertically opposite angles share the same vertex and are created when two straight lines cross. The shared vertex is marked X in the diagram below:



$a^\circ$  and  $b^\circ$  are vertically opposite angles.

Vertically opposite angles are equal:  $a^\circ = b^\circ$

If you know the size of angle  $a$ , you know that angle  $b$  will be the same size.

You will also notice in the diagram above that the remaining two angles are also vertically opposite and will also be the same size.

We know that the number of degrees in a full turn is  $360^\circ$  so if we know the size of one angle of the four in the diagram, we can work out the size of the other three angles.

Let's suppose that angle  $a$  measured  $50^\circ$ , this means that angle  $b$  must also be  $50^\circ$

$$\text{Angle } a + \text{angle } b = 100^\circ$$

To find the size of the remaining angles  $c$  and  $d$ :  $360^\circ - 100^\circ = 160^\circ$

We know that angles  $c$  and  $d$  are the same size so  $160^\circ$  divided by 2 =  $80^\circ$

To check, we add all four angles together to make sure they total  $360^\circ$

$$50^\circ + 50^\circ + 80^\circ + 80^\circ = 360^\circ$$

Now it's your turn: You need to refer to the Power Maths questions ( see worksheet 9 resource). To answer the questions, you will be using calculations like the ones shown in the examples above.