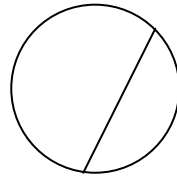
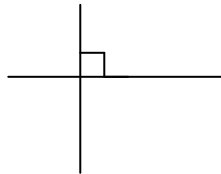


## Chords and Perpendicular Lines

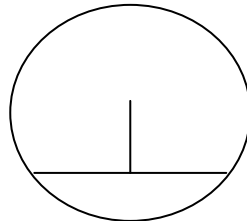
- A **chord** is a line that passes from one side of a circle to the other but which does not pass through the centre.



- A **perpendicular** line always cuts at  $90^\circ$ . If it bisects a line then it cuts it exactly in half. It is often called a **perpendicular bisector**. When questions are talking about this then you need to use the equation of a normal and the midpoints.



- The perpendicular bisector of a chord always passes through the centre of a circle.

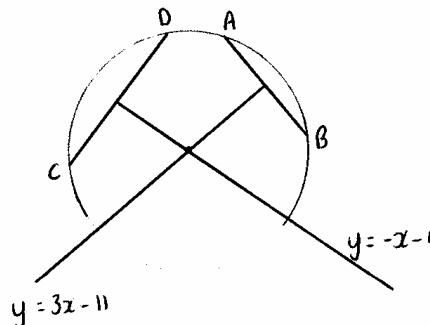


- The key to success is that you always need to draw a sketch so you know what is going on.

*Example 1. The Lines AB and CD are chords of a circle. The line  $y = 3x - 11$  is the perpendicular bisector of AB. The line  $y = -x - 1$  is the perpendicular bisector of CD. Find the coordinates of the centre of the circle.*

We know the perpendicular bisector  
of a chord passes through the centre

so the centre of the circle is  
where the lines meet! So solve  
simultaneously



$$y = 3x - 11$$

$$y = -x - 1$$

$$\therefore 3x - 11 = -x - 1$$

$$4x - 11 = -1$$

$$4x = 10$$

$$x = \frac{10}{4}$$

$$\text{if } x = \frac{10}{4} \quad \text{then} \quad y = -x - 1$$

$$y = -\frac{10}{4} - 1$$

$$y = -3.5$$

$\therefore$  The Centre of the circle is  $(2.5, -3.5)$