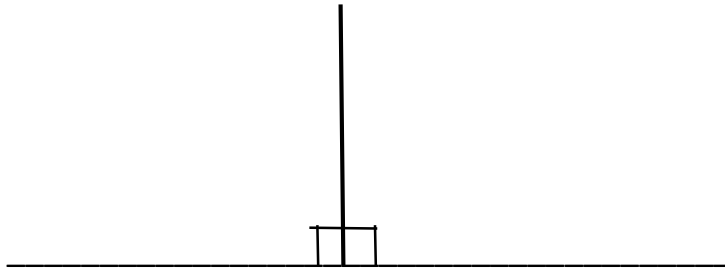


Calculate missing angles around a point

Tuesday 9th June 2020

Yesterday, we thought about angles on a straight line, and we learnt that two right angles together make a straight line ($90^\circ + 90^\circ = 180^\circ$).



Today, we are going to consider angles around a point. First of all, we need to think about 'turns' or 'rotation' and how many degrees we might move through as we turn. These pictures of a compass might help to explain this...



Here, the needle on the compass is aligned along the line AB. The red N is $0^\circ/360^\circ$ and we can see a scale in degrees running around the outside up to 360° . Counting around the scale clockwise from 0° , we can see that the scale crosses the line again at S (180°).



Turning the compass a quarter turn, through 90° to a right angle to the line, we can see that the red part of the needle now points at E (90°).



A further quarter turn through 90° (a second right angle) brings the compass to face the opposite direction. The red part of the needle now points to the S (180°) – two right angles, $90^\circ + 90^\circ = 180^\circ$.

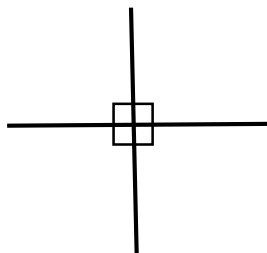


Another quarter turn through 90° (a third right angle) brings the compass to three-quarters of a turn. The red part of the needle now points to the W (270°) – three right angles, $90^\circ + 90^\circ + 90^\circ = 270^\circ$.

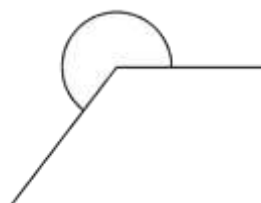


A final quarter turn through 90° (a fourth right angle) brings the compass back to where it began – a full turn. The red part of the needle now points to the N again ($0^\circ/360^\circ$) – four right angles, $90^\circ + 90^\circ + 90^\circ + 90^\circ = 360^\circ$.

So, angles on a straight line add to 180° and angles around a point add to 360° . We can use this information to calculate 'missing' angles, based on other, given information.

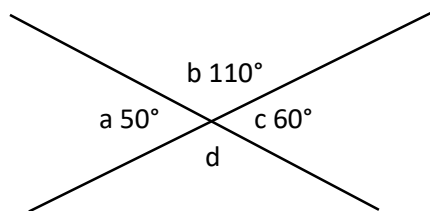


Yesterday, we revised the names of three kinds of angles – right, acute and obtuse. We now need to add another – reflex. A reflex angle is greater than 180° and less than 360° , and can look like this;



Armed with this knowledge, we can now have a go at practicing some calculations...

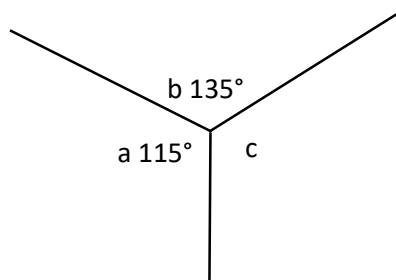
Here are four angles around a point;



Here we go, then. In the drawing above, we are given the values of angles a, b and c, but not d. We know that $a + b + c + d = 360^\circ$. Let's start by adding together what we know;

Angle a	50°	Angle d = $360 - 220$	360	d = 140°
Angle b	+ 110°		<u>-220</u>	
Angle c	<u>60°</u>		140	
Total	220°			

What about three angles around a point;



We are given the values of angles a and b, but not c. We know that $a + b + c = 360^\circ$. Let's start by adding together what we know;

Angle a	115°	Angle c = $360 - 250$	360	c = 110°
Angle b	+ <u>135°</u>		<u>-250</u>	
Total	250°		110	

It doesn't matter how many angles there are around the point – they will always add together to make 360° .

Your tasks will be based on this teaching. You might also find it useful to watch the YouTube video that goes with this, as I explain each step and complete the calculations.