**Mathematics Department Workshops**  
**Topic: Circle Theorems**  
**Resource Sheet HT1.CIR.5**

**Circle Theorems Activity 5: Geometric Proof 2**  
Proving the angle at the centre is twice the angle at the circumference

<table>
<thead>
<tr>
<th><strong>180° – 2y</strong></th>
<th>isosceles</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOC</td>
<td>circumference</td>
</tr>
<tr>
<td>x</td>
<td>angle</td>
</tr>
<tr>
<td>centre</td>
<td>BO</td>
</tr>
<tr>
<td>360°</td>
<td>point</td>
</tr>
<tr>
<td>radii</td>
<td>CBO</td>
</tr>
<tr>
<td>sum</td>
<td>180°</td>
</tr>
</tbody>
</table>

O is the centre of the circle and A, B and C are points on the circumference. Complete the missing words from the list above to complete the proof.

AO, ________ and CO are all ________.

This means triangle AOB is ________ so angle ABO is ________.

Similarly, ________ COB is isosceles so angle ________ is y.

As the ________ of the angles in a triangle equals ________, then angle AOB is 180° – 2x.

Similarly, ________ COB is ________.

As the sum of the angles at a ________ equals 360°, then:

\[
(180° – 2x) + (180° – 2y) + \text{angle AOC} = ________ .
\]

Hence, angle ________ = 2x + 2y.

This ________ that the angle at the ________ is twice the angle at the ________.

Why does this approach also prove that the angle in a semicircle is 90°?

Add any relevant terms to the Glossary poster