Guidance for tutors

<table>
<tr><td>Outcome</td><td>SLAV2</td><td>Student can consistently:</td><td>Find the circumference and area of circles.</td></tr>
<tr><td>How the topic is examined</td><td colspan="3">

Examined through test paper questions.
Questions are equally likely to appear on calculator and non-calculator papers.
If a question appears on a non-calculator paper students are expected to leave their answer in terms of π.
Students should be expected to know the formulae for all these shapes, they will not be told them in the examination.
Questions could have integer, fractional, decimal and surd valued sides.

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<tr><td>Prior knowledge</td><td colspan="3">

Students should be confident:

Multiplying and dividing without a calculator.
Finding the area of basic shapes (SLAV1)

In addition questions involving this topic can have links to:

Volume of a cylinder (SLAV4)

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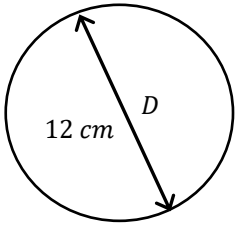
<tr><td>Suggested tuition approaches</td><td colspan="3">

The radius of a circle is the distance from the centre to the circumference. The diameter is all the way across the circle (i.e. twice the length of the radius)

<table>
<tr><th>Shape</th><th>Notes</th></tr>
<tr><td> 
</td><td>$$Circumference = \pi \times Diameter = \pi \times D$$
So for the circle opposite the circumference is
$$C = \pi \times D = \pi \times 12 = 12\pi\ cm\ \ or\ 37.7cm$$
The circumference of a circle is the distance all the way around the shape. This is sometimes referred to as the perimeter.</td></tr>
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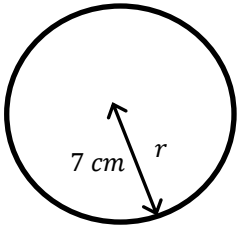
	Some students may use $C = 2\pi r$
	$Area = \pi \times radius \times radius = \pi \times r^2$ So for the circle opposite the area is $A = \pi \times r^2 = \pi \times 7^2 = 49\pi\ cm^2$ or $154cm^2$

- Students should be expected to find the area and perimeter of a semi-circle and quarter circles.
- Sometimes the question may give the radius when you need to use the diameter. If this is the case students will need to work this out first.
- A circle may not always be drawn; it is worthwhile starting the question by drawing a diagram.
- Students should ensure that all the units are the same, if not they will need to convert one to the other.
- Show all working and ensure that squared units are on the answer for area.

Common errors and misconceptions

- Students forget to put units – particularly when answers are given in terms of π
- If units are not the same, students need to convert one to the other.
- Errors are made when working out the area of shapes without a calculator.
- One mark is given for 'stating the units' of an answer – many students lose the mark because they forget to or state the wrong units.
- The units of perimeter are length (e.g. mm, cm, metres etc…)
- When finding the area of a semi-circle students forget to divide by 2.
- When finding the perimeter of a semi-circle students forget to add on the diameter as otherwise they would just be finding half of the circumference and not the perimeter of the shape.

Guidance for tutors

Suggested resources	• Video tutorial
	  ○ http://corbettmaths.com/2013/12/22/area-of-a-circle-video-40-and-59/ (area of a circle)
	  ○ http://corbettmaths.com/2013/12/23/area-of-a-semi-circle-video-47/ (area of a semi-circle)
	  ○ http://corbettmaths.com/2013/12/21/circumference-video-60/ (circumference)
	  ○ http://corbettmaths.com/2012/08/02/perimeter-of-a-semi-circle/ (perimeter of a semi-circle)
	• Questions
	  ○ http://www.cimt.org.uk/projects/mepres/allgcse/bkb7.pdf (pp 32 - 37)
	  ○ https://corbettmaths.files.wordpress.com/2013/02/circumference-pdf.pdf
	  ○ https://corbettmaths.files.wordpress.com/2013/02/area-of-a-circle-pdf.pdf
	  ○ https://corbettmaths.files.wordpress.com/2013/02/area-of-a-semicircle-pdf.pdf
	• Past GCSE Questions
	  ○ https://keshgcsemaths.files.wordpress.com/2013/11/36_circles-area-and-circumference2.pdf