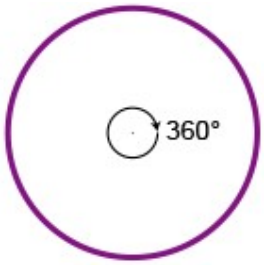
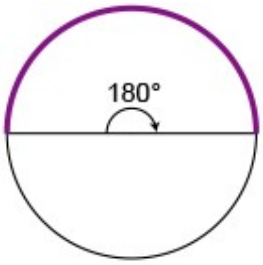
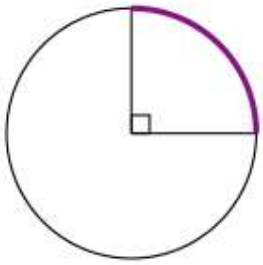
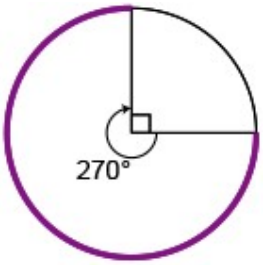
ARC LENGTH AND SUBTENDED ANGLE

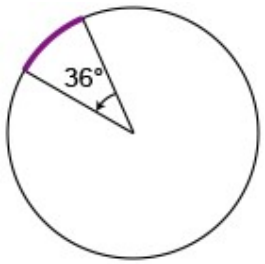
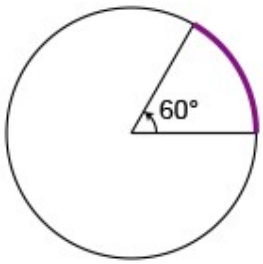
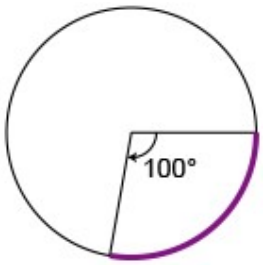
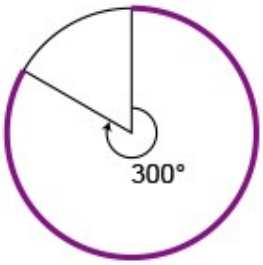
SOLUTIONS

TASK 1 Explore the relationship between arc length and the angle it subtends

			
$C = 36$ cm	$L = 18$ cm	$L = 9$ cm	$L = 27$ cm

Did you notice that 90° is $\frac{1}{4}$ of 360° and so the arc length subtended by 90° is $\frac{1}{4}$ of the circumference?

Similarly, 270° is $\frac{3}{4}$ of 360° and subtends an arc length that is $\frac{3}{4}$ of the circumference.

			
$\frac{36}{360} = \frac{1}{10}$	$\frac{60}{360} = \frac{1}{6}$	$\frac{100}{360} = \frac{5}{18}$	$\frac{300}{360} = \frac{5}{6}$
Arc length is $\frac{1}{10}$ of the circumference length.	Arc length is $\frac{1}{6}$ of the circumference length.	Arc length is $\frac{5}{18}$ of the circumference length.	Arc length is $\frac{5}{6}$ of the circumference length.
$L = 3.6$ cm	$L = 6$ cm	$L = 10$ cm	$L = 30$ cm

TASK 2 Write a formula for the arc length/subtended angle relationship

You can calculate the length of any arc if you know the radius of the circle and the angle that the arc subtends at the centre.

$$\textbf{Arc length} = \frac{x}{360} \times 2\pi r$$

The arc is a fraction of the whole circumference.