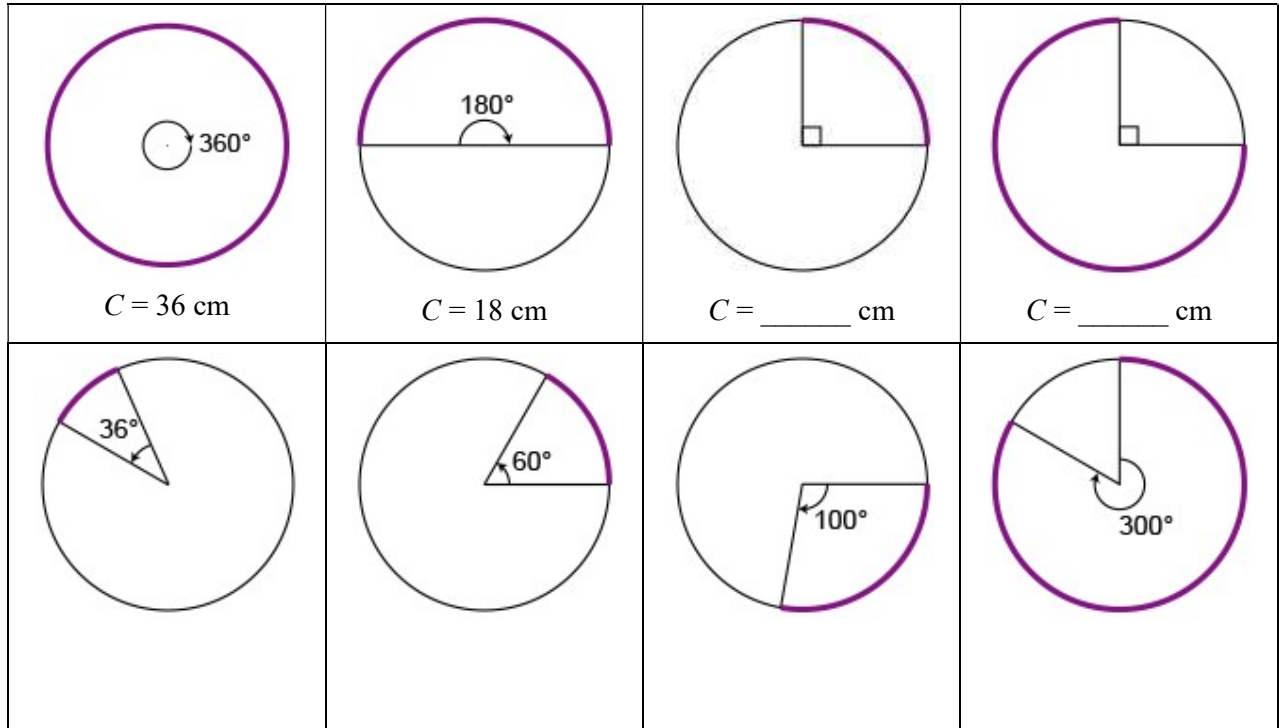


## ARC LENGTH AND SUBTENDED ANGLE

Investigate the relationship between arc length and the angle that the arc subtends at the circle's centre.

### TASK 1 Is there a relationship between arc length and the angle it subtends?

A circle has radius,  $r$ , and a circumference of 36 cm. It subtends an angle of  $360^\circ$  at its centre. An arc that subtends an angle of  $180^\circ$  at the centre is 18 cm long (half of the circumference). Predict the arc lengths for the other 6 circles, which all have the same radius.



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

Note that for all the circles in task 1:  $\frac{\text{arc length}}{\text{circumference}} = \frac{\text{subtended angle}}{\text{full turn}}$

You can rewrite this as:

$$\text{arc length} = \frac{\text{subtended angle}}{\text{full turn}} \times \text{circumference}$$

Use this to write a formula for the arc length shown in this diagram.

$$\text{Arc length} = \frac{\boxed{\quad}}{360} \times \underline{\quad}$$

