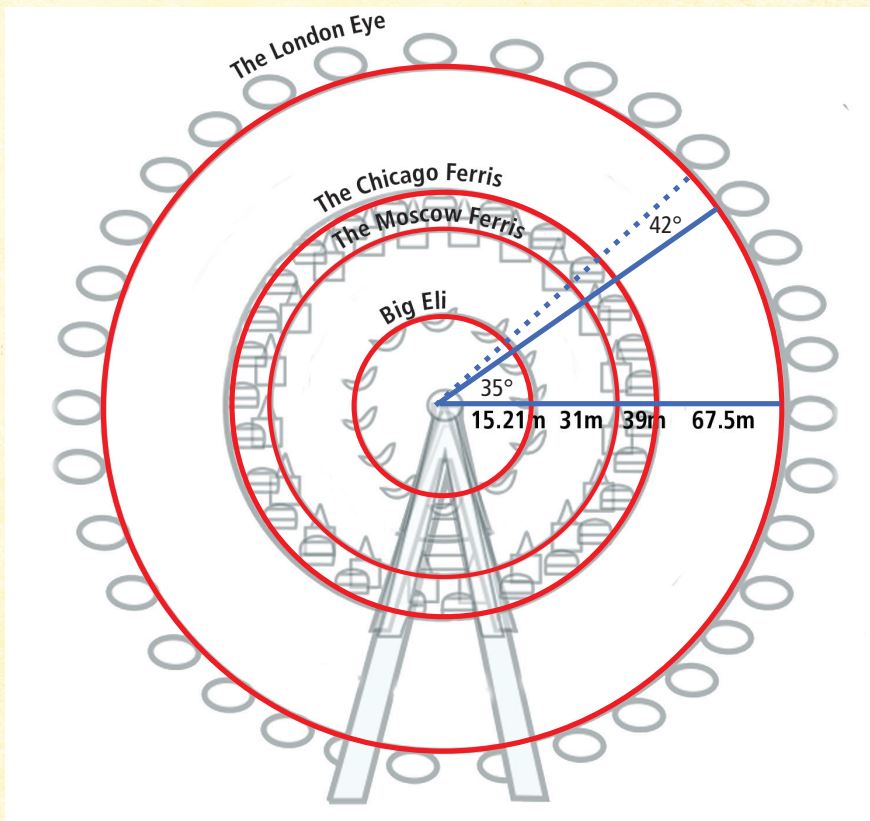


Plato's protractor™ V

Measuring a ferris wheel ride.



Here are the four ferris wheels from the 'All about pi' investigation overlaid. We can use radians to measure how far around the circumference of each that we travelled when we travelled for 35° of rotation.

Radians are really helpful for simplifying circles, so we can measure them.

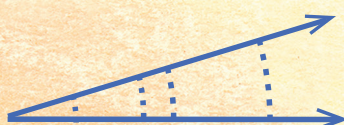
Start by converting 35° to radians (remember there are 2π, or about 6.28, radians in a full revolution).

Method 1
 $\frac{35}{360} = 9.7\%$ of a rotation
 Using a calculator: 9.7% of 6.28 is 0.61 radius lengths (cut off by an angle of 0.61 radians)

Method 2
 $\frac{35}{360} = \frac{x}{6.28}$
 Where x = radians in 35°
 $360x = 219.8$
 $x = 0.61$ radians

To find the distance travelled around the circumference we multiply the number of radians travelled in 35° by the radius of each ferris wheel. Using the same method work out how far you would travel around the circumference of each wheel for 42° of rotation. Put your radian calculation for 42° and your arc length calculation for each wheel in the two final columns of the table. Answers in the Explorer section of MAC.

Ferris wheel	Radius (m)	angle of rotation			angle of rotation		
		in degrees	in radians	distance travelled in metres	in degrees	in radians	distance travelled in metres
Big Eli	15.21	35°	0.61	9.28	42°		
Moscow Ferris	31.51			19.22			
Chicago Ferris	39.15			23.9			
London Eye	67.5			36.6			



The curved line inside an angle drawing represents a family of cut off arc lengths for that particular angle. We have calculated four of them but they are infinite in number. The Mathomat protractor can be used to measure them in degrees and radians.