

Sometimes, it's useful to calculate the arc length or area of a sector, for example in marking a football pitch.

Here, the penalty spot, marked C, is also the centre of a circle.

If the radius is nine point one five metres, what is the length of the arc AB?

The arc length is a fraction of the circumference, which equals π times diameter.

The fraction is the same as the angle at the centre divided by 360 degrees.

The Arc length is calculated using the fraction times π times diameter.

Substitute in the values given: 106 divided by 360 π times 18 point three, which is twice the radius, nine point one five.

106 divided by 360 times π times 18 point three is 16 point nine two seven, or, rounded up, 16 point nine three metres.

The area of a sector is a fraction of the area of a circle, times πr^2 .

A Landscape gardener needs to put gravel in a sector of a patio as shown. How much gravel is needed?

Substitute in the values given: 54 is the angle, divide this by 360, times π , times the radius squared.

54 over 360, times π times seven point three squared is 25 point one square metres.

Rounding up to whole numbers, the gardener needs 26 square metres of gravel.

Remember, you can work out arc length or sector area by dividing the central angle by 360 and multiplying by the circumference or by the area.