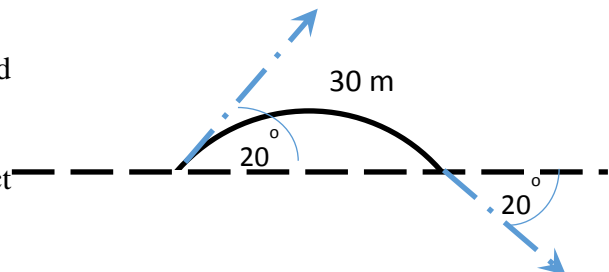


Section 2: Circular measure

Exercise level 2

- An equilateral triangle is inscribed in a circle of radius 10 cm.
 - Find the area of the circle
 - Find the area of the triangle
 - Find the area of the three segments surrounding the triangle.
- How far is a chord AB from the centre of a circle of radius 5 cm given that the arc length AB is 9.3 cm?
- Use small angle approximations to find an approximate value for the smallest positive root of each of the following equations.
 - $3 \cos x - \sin 2x = 2$
 - $x \tan x = 5 \sin x - \cos x$
- Once upon a time a hermit found an island shaped like a triangle with straight shores of lengths 6 km, 8 km, and 10 km. Needing seclusion, he declared that no one should approach within 1 km of his shore. What was the area of his 'exclusion' zone?
- Two circles with centres A and B intersect at points P and Q such that $\angle APB$ is a right angle and $\angle PAQ = \frac{\pi}{3}$. If $AB = 10$ cm, find the length of the perimeter of the region common to the two circles.
- Two parallel chords of lengths 8 cm and 11 cm lie on the same side of a circle of radius 6 cm. Calculate the perimeter and area of the region enclosed by the two chords.
- Part of a hump-backed bridge is modelled by an arc of a circle, placed on a horizontal straight line representing the road on either side, as in the diagram. The length along the curve of the road is 30 metres, and while travelling over the bridge the direction of a vehicle changes from 20° above horizontal to 20° below horizontal.

- Find the angle in radians subtended at the centre of the circle in the model, and find the radius of the curve of the bridge, giving an exact answer in terms of π .



- The side of the arch is to be built of brick, extending from ground level to the road surface. Find the area of the brickwork, on one side of the bridge, to the nearest square metre.