

19th August

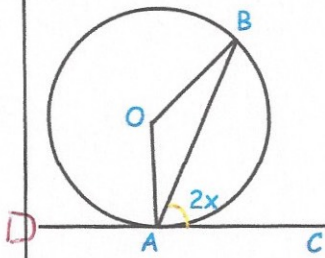


Corbettmaths

Show using algebra

$$1.0\dot{2}\dot{4} = 1\frac{4}{165}$$

$$\begin{aligned} x &= 1.02424 \\ 10x &= 10.2424 \\ 100x &= 102.4242 \\ 1000x &= 1024.2424 \\ 990x &= 1014 \end{aligned} \quad \begin{aligned} x &= \frac{1014}{990} \\ &= 1\frac{4}{165} \end{aligned}$$



A and B are points on the circumference of a circle, centre O.
CA is a tangent to the circle.
Angle CAB = $2x$

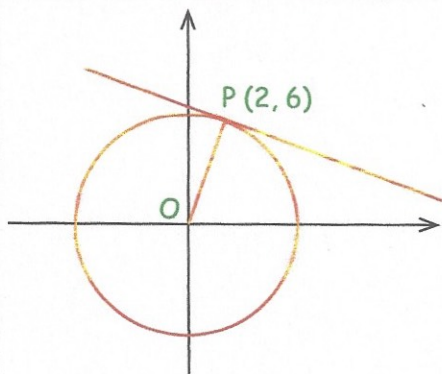
Prove that angle AOB = $4x$
Give reasons for each stage of your working.

$\angle OAD = 90^\circ$ Tangent meets a radius at a right angle

$$\begin{aligned} \angle OAB &= 180 - (90 + 2x) \\ \text{Angles in a straight line add up to } 180 \end{aligned}$$

$$\begin{aligned} \angle OBA &= 180 - (90 + 2x) \\ \text{Base angles in isosceles are equal} \end{aligned}$$

$$\begin{aligned} \angle AOB &= 180 - (180 - (90 + 2x) - (90 + 2x)) \\ &= 180 - (180 - 4x) \\ &= 4x \quad \text{Angles in triangle add to } 180 \end{aligned}$$



The diagram shows the circle $x^2 + y^2 = 40$ with a tangent at the point (2, 6)

Find the area of the circle

$$\begin{aligned} \text{radius is } \sqrt{40} \\ \pi \times \sqrt{40}^2 = 40\pi \end{aligned}$$

Find the equation of the tangent

$$\begin{aligned} \frac{6-0}{2-0} &= 3 \quad \text{gradient of line is } -\frac{1}{3} \\ y &= -\frac{1}{3}x + c \quad c = \frac{20}{3} \\ 6 &= -\frac{1}{3}(2) + c \quad y = -\frac{1}{3}x + \frac{20}{3} \end{aligned}$$