ICSE 10,2019

AI21BTECH11016

PROBLEM 4-C :

Draw a circle of radius $4cm$. Take a point P outside the circle at a distance of $7cm$ from the centre of the circle and construct a pair of tangents to the circle from that point. Measure and write down the length of any one tangent.

Solution: The input parameters for this construction are available in TABLE 1.

Symbol	Value	Description
r	4	*Radius*
d	7	Distance of **P** from the origin
$sin\theta$	$\frac{r}{d}$	Angle between the tangent from **P** and d
P	**0**	Origin
O	$\begin{pmatrix} d \\ 0 \end{pmatrix}$	Center of circle
$\mathbf{Q}_i$	$r\cot\theta \begin{pmatrix} \cos\theta \\ \pm\sin\theta \end{pmatrix}$	Points of Contact

TABLE I

Generating the figure using Python.
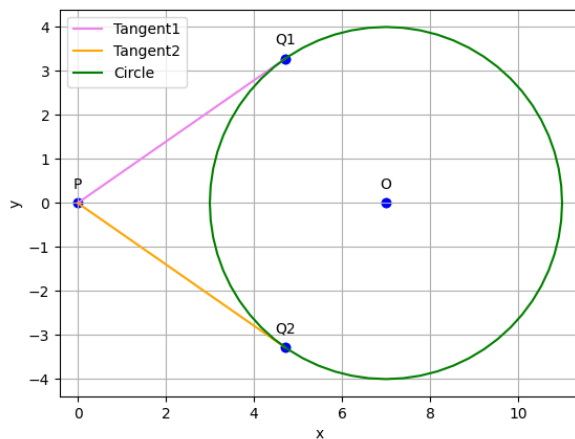

Given:

$$OP = 7 \qquad (1)$$
$$OQ2 = 4 \qquad (2)$$

Consider $\triangle OQ2P$,
$\angle OQ2P = \Pi/2$,
$\Rightarrow$From Pythogorean Theorem,

$$OP^2 = OQ2^2 + PQ2^2 \qquad (3)$$

From equations 1, 2 and 3
$$\Rightarrow (7)^2 = (4)^2 + PQ2^2$$
$$\Rightarrow PQ2^2 = 33$$
$$\Rightarrow PQ2 = \sqrt{33}.$$

$\therefore$ **The length of tangent drawn from P onto the Circle is $\sqrt{33}$.**