

ICSE 10,2019

AI21BTECH11016

1 PROBLEM 4-C

- 1.1. 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.

$$\Rightarrow OP^2 = OQ^2 + PQ^2$$

$$OP = 7 \text{ and } OQ = 4$$

$$\Rightarrow PQ^2 = \sqrt{33}$$

Therefore, the length of tangent from P is $\sqrt{33}$

Solution: The input parameters for this construction are available in TABLE 1.1.1.

Symbol	Value	Description
r	3.5	Radius
d	7	Distance of P from the origin
$\sin\theta$	Angle between the tangent from P and d	
P	0	Origin
O	$\begin{pmatrix} d \\ 0 \end{pmatrix}$	Centre of the circle
Q_i	$r \cot \theta \begin{pmatrix} \cos \theta \\ \pm \sin \theta \end{pmatrix}$	Points of Contact

TABLE 1.1.1

- 1.2. Generating the figure using Python.

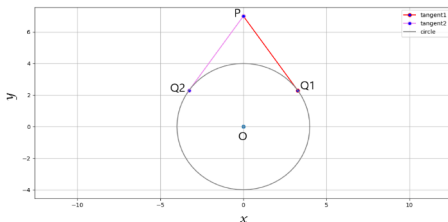


Fig. 1.2.1.

Consider $\triangle OQ_2P$,

$\angle OQ_2P = \pi/2$,

From Pythagorean Theorem,