1. A quadrilateral $ABCD$ is drawn to circumscribe a circle (see Figure 5). Prove that $AB + CD = AD + BC$.

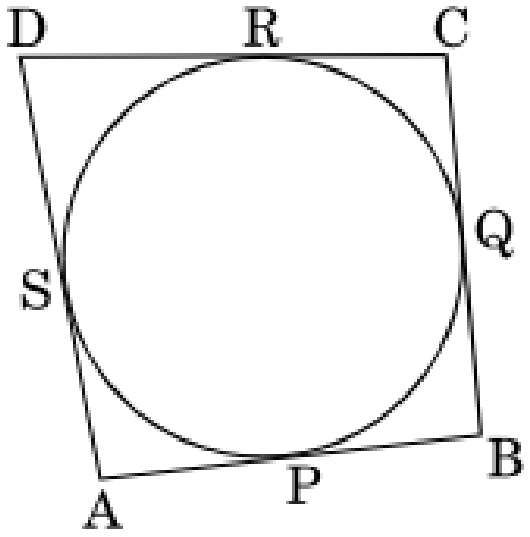

Figure 1:

2. Draw a pair of tangents to a circle of radius $4cm$ which are inclined to each other at an angle of $45°$.

3. A point **T** is $13cm$ away from the centre of a circle. The length of the tangent drawn from **T** to the circle is $12cm$. Find the radius of the circle.

4. Two tangents TP and PQ are drawn to a circle with centre **O** from an external point **T**. Prove that $\angle PTQ = 2\angle OPQ$.

5. PQ is a tangent to a circle with centre **O** at the point **P** on the circle. If $\triangle OPQ$ is an isosceles triangle, then find $\angle OQP$.

6. Two concentric circles have radii $10cm$ and $6cm$. Find the length of the chord of the larger circle which touches the smaller circle.

7. If tangents PA and PB from an external point **P** to a circle with centre **O** are inclined to each other at an angle of $70°$, then find $\angle POA$.

8. ABC is right triangle, right-angled at **B** with $BC = 6cm$ and $AB = 8cm$. A circle with centre **O** and radius r cm has been inscribed in $\triangle ABC$ as shown in the figure. Find the value of r.

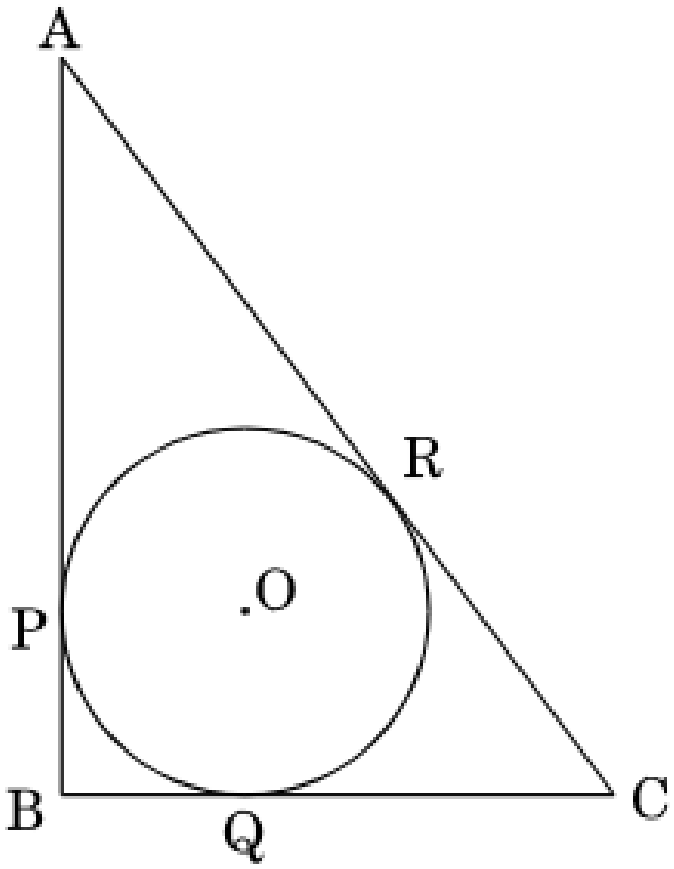

Figure 2:

9. Draw a circle of radius $5cm$. From a point $8cm$ away from its centre, construct a pair of tangents to the circle.

10. In the given figure, PT and PS are tangents to a circle with centre **O**, from a point **P**, such that $PT = 4cm$ and $\angle TPS = 60°$. Find the length of the chord TS. Also, find the radius of the circle.

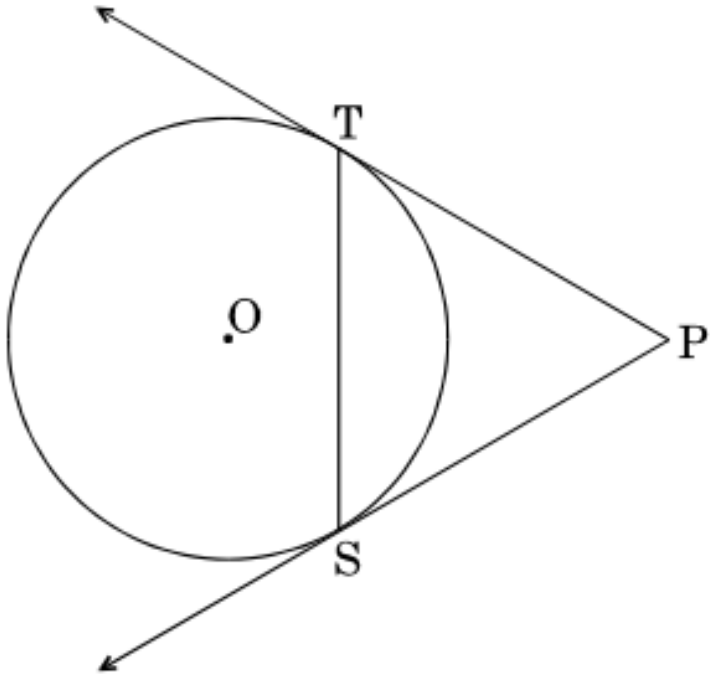

Figure 3:

11. (a) In a right triangle ABC, right-angled at **B**, $BC = 6cm$ and $AB = 8cm$. A circle is inscribed in the $\triangle ABC$. Find the radius of the incircle.

    (b) Two circles touch externally at **P** and AB is a common tangent, touching one circle at **A** and the other at **B**. Find the measure of $\angle APB$.

12. From an external point **P**, tangents PQ and PR are drawn to a circle with centre **O**, touching the circle at **Q** and **R**. If $\angle QOR = 140°$, find the measure of $\angle QPR$.

13. A circle touches all the sides of a quadrilateral $ABCD$. Prove that $AB + CD = DA + BC$.

14. Write the steps of construction of a circle of diameter $6cm$ and drawing of a pair of tangents to the circle from a point $5cm$ away from the centre.