

Tangents to Circles (C)

A line is said to be tangent to a circle if it intersects the circle at one point. The intersection point is called the point of tangency, and the line is said to be tangent to the circle at the intersection point. If the line \mathcal{L} is tangent to the circle \mathcal{C} at the point P , then \mathcal{L} is perpendicular to the line determined by the center of \mathcal{C} and P .

Exercises

1.

Suppose that the circle \mathcal{C} has radius 2, and two radii are drawn at right angles to one another. A tangent line is drawn to \mathcal{C} at each of the points where the radii intersect the circle. How far from the center of the circle do these tangent lines intersect?

2.

Referring to the previous problem. A third radius is drawn, bisecting the right angle formed by the preceding pair of radii, and the tangent line is drawn to \mathcal{C} at the point where this radius intersects the circle. How long is the segment formed by the intersection of this tangent line with the first pair of tangent lines?