

1. A circle with the centre $(2; 1)$ touches the absciss axis. Give the intersection points with the ordinate axis.
2. Find the equation of the line (c) which is perpendicular to the vector $\vec{a}(3; 4)$ and goes through $P(4; 5)$. Give the coordinates of the vertices of the triangle whose sides are $a : y - 2x = 2$, $b : 2y - x = -2$ and the equation above.
 - (a) Give the equation of the circumscribed circle.
 - (b) Give the coordinates of the orthocentre and the centroid.
 - (c) Give the perimeter and the area of the triangle.
3. We draw tangents to the circle $x^2 + y^2 = 36$ from a point P which lies on the negative half of the y-axis. The length of the tangent segments is 8 units. What is the distance between the origin and the point of intersection of the tangents with the x-axis?
4. Determine the equation of the circle which passes through point $P(13; 8)$ and the points of intersection of the circles $(x - 3)^2 + (y - 2)^2 = 8$ and $(x - 9)^2 + (y - 2)^2 = 20$.
5. Give the equation of a circle which touches an external circle $(x - 12)^2 + (y + 10)^2 = 100$, and touches an internal circle $(x + 4)^2 + (y - 2)^2 = 100$, and touches the y-axis.