**Circle Geometry Problems**

(a) A circle C has the equation . The line passes through the circle at points A and B. Find the length of the line AB.

(b) The points A and B lie on circle C. The line AB is a diameter of the circle. Find the equation of the circle.

(a) The point P with coordinates lies on the circle with equation . Point Q also lies on the circle, and PQ is a diameter of the circle. Find the coordinates of point Q.

(b) A circle C has centre . Point P with coordinates lies on circle C. Find the coordinates of the points where the circle crosses the -axis.

(a) Determine whether the point lies inside, outside or on the circle with equation .

(b) A circle has diameter AB where A is and B is . Find the equation of the tangent to the circle at point A, giving your answer in the form , where , and are integers to be found.

(a) A circle with equation has centre O and passes through the point P with coordinates . Line L is the tangent to the circle at point P. Line L meets the -axis at A and the -axis at B. Find the area of the triangle OAB.

(b) The circle C has the equation . Find the two values of for which the line is a tangent to circle C.

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