Equation of a Tangent to a Circle

(a) The point P $(6, -2)$ lies on the circle with equation $x^2 + y^2 = 40$. Find the gradient of the tangent to the circle at point P.

(b) The point Q $(2, 1)$ lies on the circle with equation $x^2 + y^2 = 5$. Find the gradient of the tangent to the circle at point Q.

(a) The point A $(2, -5)$ lies on the circle with equation $x^2 + y^2 = 29$. Find the equation of the tangent to the circle at point A.

(b) The point B $(-3, -2)$ lies on the circle with equation $x^2 + y^2 = 13$. Find the equation of the tangent to the circle at point A.

(a) The point R $(-2, -3)$ lies on the circle with centre $(1, 2)$ and radius $\sqrt{34}$. Find the equation of the tangent to the circle at point R.

(b) The point S $(7, 1)$ lies on the circle with centre $(x - 3)^2 + (y + 2)^2 = 25$. Find the equation of the tangent to the circle at point S.

(a) Point P $(-2, 8)$ lies on a circle with centre $(-1, 6)$. Point Q with coordinates $(a, 5)$ lies on the tangent to the circle at P. Find the value of a.

(b) Point A $(-1, -3)$ lies on the circle with equation $(x - 3)^2 + (y + 2)^2 = 17$. The line L is the tangent to the circle at point A. Find the coordinates of the point where line L crosses the x-axis.

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