8 The equation of a circle is $x^2 + y^2 + px + 2y + q = 0$, where p and q are constants.

(a) Express the equation in the form $(x-a)^2 + (y-b)^2 = r^2$, where a is to be given in terms of p and r^2 is to be given in terms of p and q. [2]

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The line with equation $x + 2y = 10$ is the tangent to the circle at the point $A(4, 3)$.

(b) (i) Find the equation of the normal to the circle at the point A. [3]

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(ii) Find the values of p and q. [5]