3 **(a)** A circle is defined by the parametric equations $x = 3 + 2\cos\theta$, $y = -4 + 2\sin\theta$.

    (i) Find a cartesian equation of the circle. [2]

    (ii) Write down the centre and radius of the circle. [1]

(b) **In this question you must show detailed reasoning.**

The curve S is defined by the parametric equations $x = 4\cos t$, $y = 2\sin t$. The line L is a tangent to S at the point given by $t = \frac{1}{6}\pi$.

Find where the line L cuts the x-axis. [6]