



The diagram shows the curve C with equation $y = 4x^2 - 10x + 7$ and two straight lines, l_1 and l_2 . The line l_1 is the normal to C at the point $(\frac{1}{2}, 3)$. The line l_2 is the normal to C at the minimum point of C .

- (a) Determine the equation of l_1 , giving your answer in the form $ax + by + c = 0$, where a , b and c are integers to be determined. [4]

The shaded region shown in the diagram is bounded by C , l_1 and l_2 .

- (b) Determine the inequalities that define the shaded region, including its boundaries. [3]