Question 1.

Find the co-ordinates of the point from which tangents are drawn to the circle $x^2 + y^2 - 6x - 4y + 3 = 0$ such that the mid-point of its **chord of contact** is (1, 1).

Solution:

Assume that the required point be P(a,b). The equation of the **chord of contact** of P with respect to the given circle is

$xx_1 + yy_1 - 3(x + x_1) - 2(y + y_1) + 3 = 0$. ... (1)

it has mid-point (1, 1) so,

$x + y - 3(x + 1) - 2(y + 1) + 3 = 1 + 1 - 6 - 4 + 3$

$\Rightarrow 2x + y = 3$.

By solving ratios of the coefficients of x and y and constant terms and solving for a, b we get $a = -1, b = 0$