2. (i) For what values of a and b, will we get infinite number of solutions

$2x+3y = 7$

$(a-b)x+(a+b)y = 3a+b-2$

$2x+3y-7=0$

$(a-b)x+(a+b)y-(3a+b-2)=0.$

$a_1 = 2, \quad b_1 = 3, \quad c_1 = -7$

$a_2 = a-b, \quad b_2 = a+b, \quad c_2 = -(3a+b-2)$

$\frac{a_1}{a_2} = \frac{2}{a-b}, \quad \frac{b_1}{b_2} = \frac{3}{a+b}, \quad \frac{c_1}{c_2} = \frac{7}{3a+b-2}$

To have many solutions, $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$

$\frac{2}{a-b} = \frac{3}{a+b} = \frac{7}{3a+b-2}$

$6a+2b-4 = 7a-7b$

$9b = a+4 \quad -(1)$

$\frac{2}{a-b} = \frac{3}{a+b}$

$2a+2b = 3a-3b$

$5b = a \quad -(2)$

(1) − (2) gives,

$4b = 4 \quad b = 1$

$a = 5$