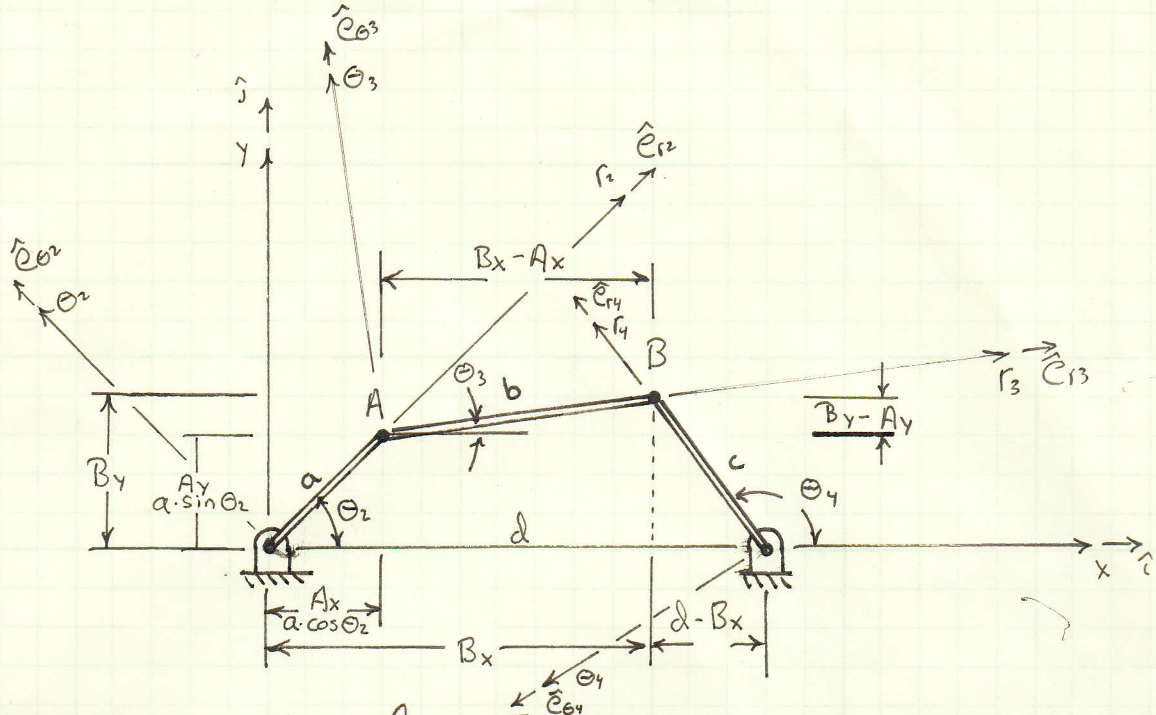

THE VALUES OF a, b, c, d, AND θ_2 ARE KNOWN, THEREFORE

$$A_x = a \cdot \cos\theta_2 \qquad (1)$$

$$A_y = a \cdot \sin\theta_2 \qquad (2)$$

THE LOCATION OF POINT B MUST NOW BE FOUND. THE LENGTHS OF LINKS b AND c CAN BE WRITTEN

$$b^2 = (B_x - A_x)^2 + (B_y - A_y)^2 \qquad (3)$$

$$c^2 = (d - B_x)^2 + B_y^2 \qquad (4)$$

SUBTRACTING THESE TWO EQUATIONS

$$b^2 - c^2 = (B_x - A_x)^2 - (d - B_x)^2 + (B_y - A_y)^2 - B_y^2$$

$$b^2 - c^2 = B_x^2 - 2 \cdot B_x \cdot A_x + A_x^2 - (d^2 - 2 \cdot d \cdot B_x + B_x^2) + B_y^2 - 2 \cdot B_y \cdot A_y + A_y^2 - B_y^2$$

$$b^2 - c^2 = \cancel{B_x^2} - 2 \cdot B_x \cdot A_x + A_x^2 - d^2 + 2 \cdot d \cdot B_x - \cancel{B_x^2} + \cancel{B_y^2} - 2 \cdot B_y \cdot A_y + A_y^2 - \cancel{B_y^2}$$

$$b^2 - c^2 = -2 \cdot B_x \cdot A_x - d^2 + 2 \cdot d \cdot B_x - 2 \cdot B_y \cdot A_y + \underbrace{A_x^2 + A_y^2}_{a^2}$$

$$b^2 - c^2 = a^2 - d^2 + 2 \cdot B_x \cdot (d - A_x) - 2 \cdot B_y \cdot A_y$$

$$2 \cdot B_x \cdot (d - A_x) = b^2 - c^2 - a^2 + d^2 + 2 \cdot B_y \cdot A_y$$

$$B_x = \frac{b^2 - c^2 - a^2 + d^2 + 2 \cdot B_y \cdot A_y}{2 \cdot (d - A_x)} = \underbrace{\frac{b^2 - c^2 - a^2 + d^2}{2 \cdot (d - A_x)}}_{K_1} + \underbrace{\frac{A_y}{d - A_x}}_{K_2} \cdot B_y$$

LETTING

$$K_1 = \frac{b^2 - c^2 - a^2 + d^2}{2\cdot(d - A_x)} = S \qquad \cancel{3} \quad (5)$$

$$K_2 = \frac{A_y}{d - A_x} \qquad \cancel{4} \quad (6)$$

THUS THE EXPRESSION FOR B_x CAN BE REWRITTEN

$$B_x = K_1\cdot + K_2\cdot B_y \qquad \cancel{5} \quad (7)$$

SUBSTITUTING (7) INTO (4)

$$c^2 = [d - (K_1 + K_2\cdot B_y)]^2 + B_y^2$$

$$= [d - K_1 - K_2\cdot B_y]^2 + B_y^2$$

$$= [(d - K_1) - K_2\cdot B_y]^2 + B_y^2$$

$$c^2 = (d-K_1)^2 - 2\cdot(d-K_1)\cdot K_2\cdot B_y + K_2^2\cdot B_y^2 + B_y^2$$

$$B_y^2\cdot(K_2^2+1) - 2\cdot(d-K_1)\cdot K_2\cdot B_y + (d-K_1)^2 - c^2 = 0$$

$$B_y^2 - \frac{2\cdot(d-K_1)\cdot K_2}{(K_2^2+1)}\cdot B_y + \frac{(d-K_1)^2 - c^2}{(K_2^2+1)} = 0$$

LETTING

$$K_3 = \frac{2\cdot(d-K_1)\cdot K_2}{K_2^2+1} \qquad (8)$$

$$K_4 = \frac{(d-K_1)^2 - c^2}{K_2^2+1} \qquad (9)$$

THE POLYNOMIAL EXPRESSION IN B_y CAN NOW BE WRITTEN

$$B_y^2 - K_3\cdot B_y + K_4 = 0$$

$$B_y^2 - K_3\cdot B_y + \left(\frac{-K_3}{2}\right)^2 - \left(\frac{-K_3}{2}\right)^2 + K_4$$

$$\left(B_y - \frac{K_3}{2}\right)^2 = \left(\frac{-K_3}{2}\right)^2 - K_4$$

$$B_y = \frac{K_3}{2} \pm \sqrt{\left(\frac{-K_3}{2}\right)^2 - K_4} \qquad (10)$$