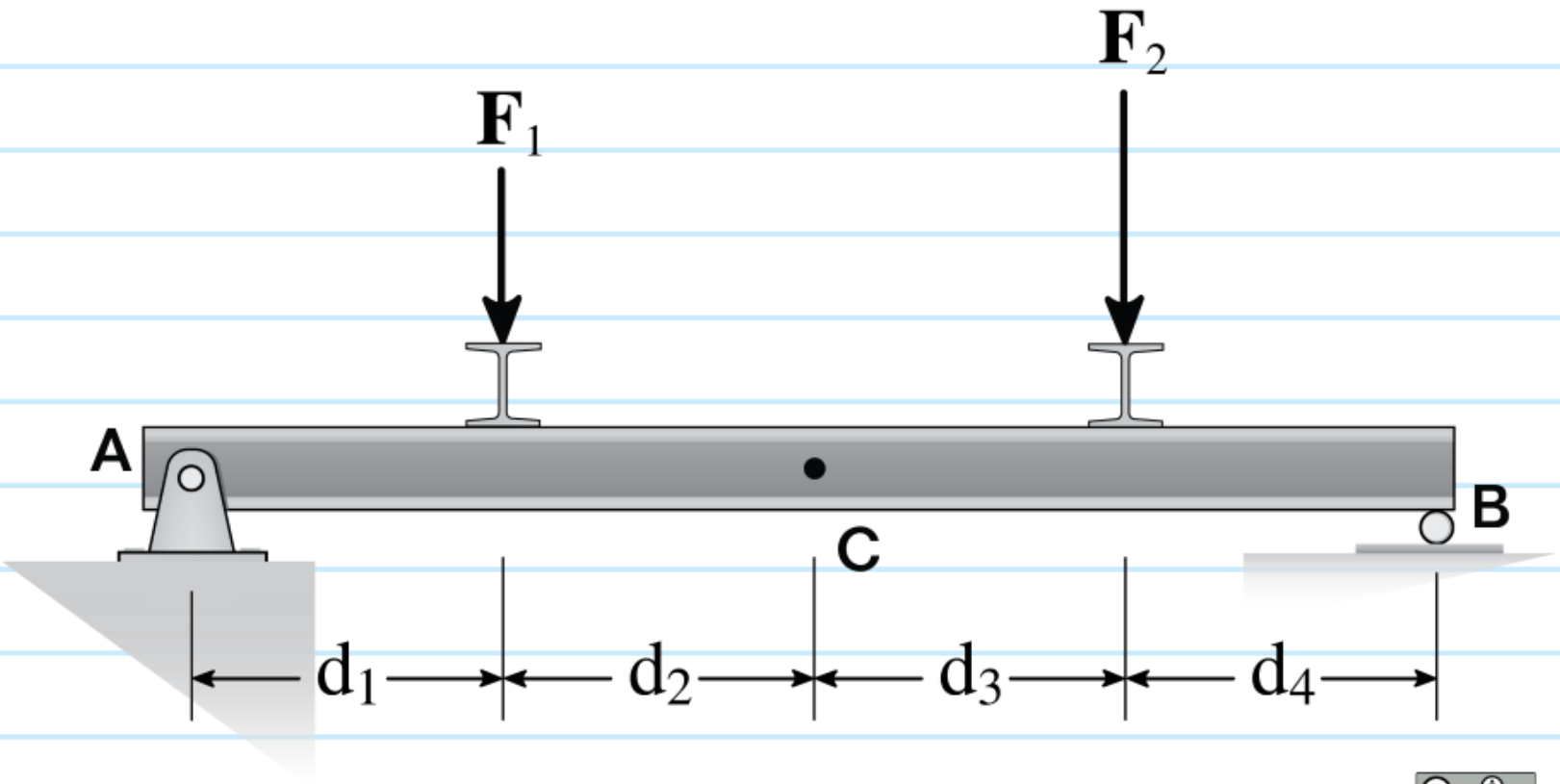
21-S-H-8-GD-001



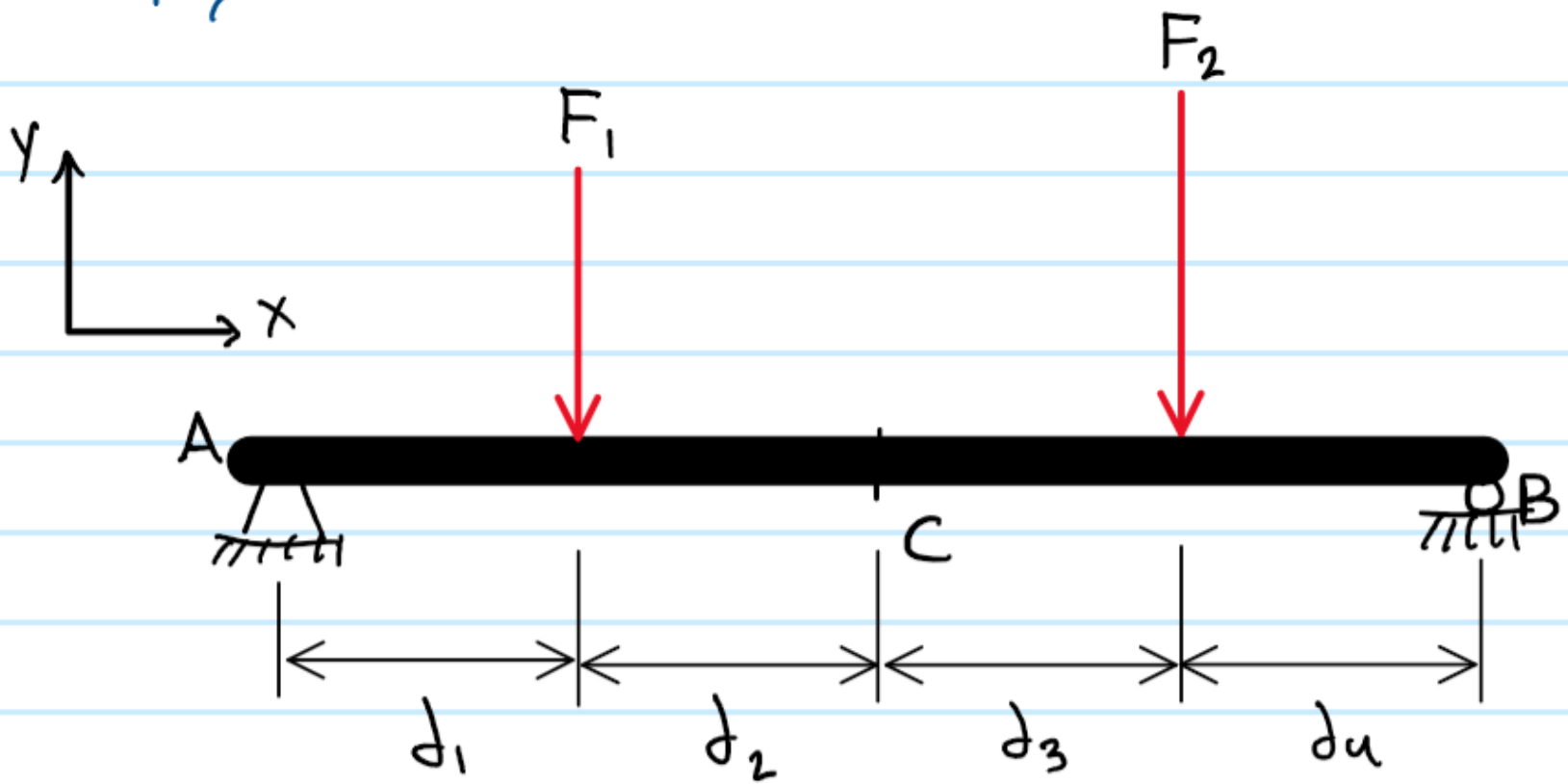



Replace the force system acting on the beam by an equivalent resultant force and find the distance x its line of action intersects the beam from point A.

($F_1 = F_1$ N, $F_2 = F_2$ N, $d_1 = d_1$ m, $d_2 = d_2$ m, $d_3 = d_3$ m, and $d_4 = d_4$ m)

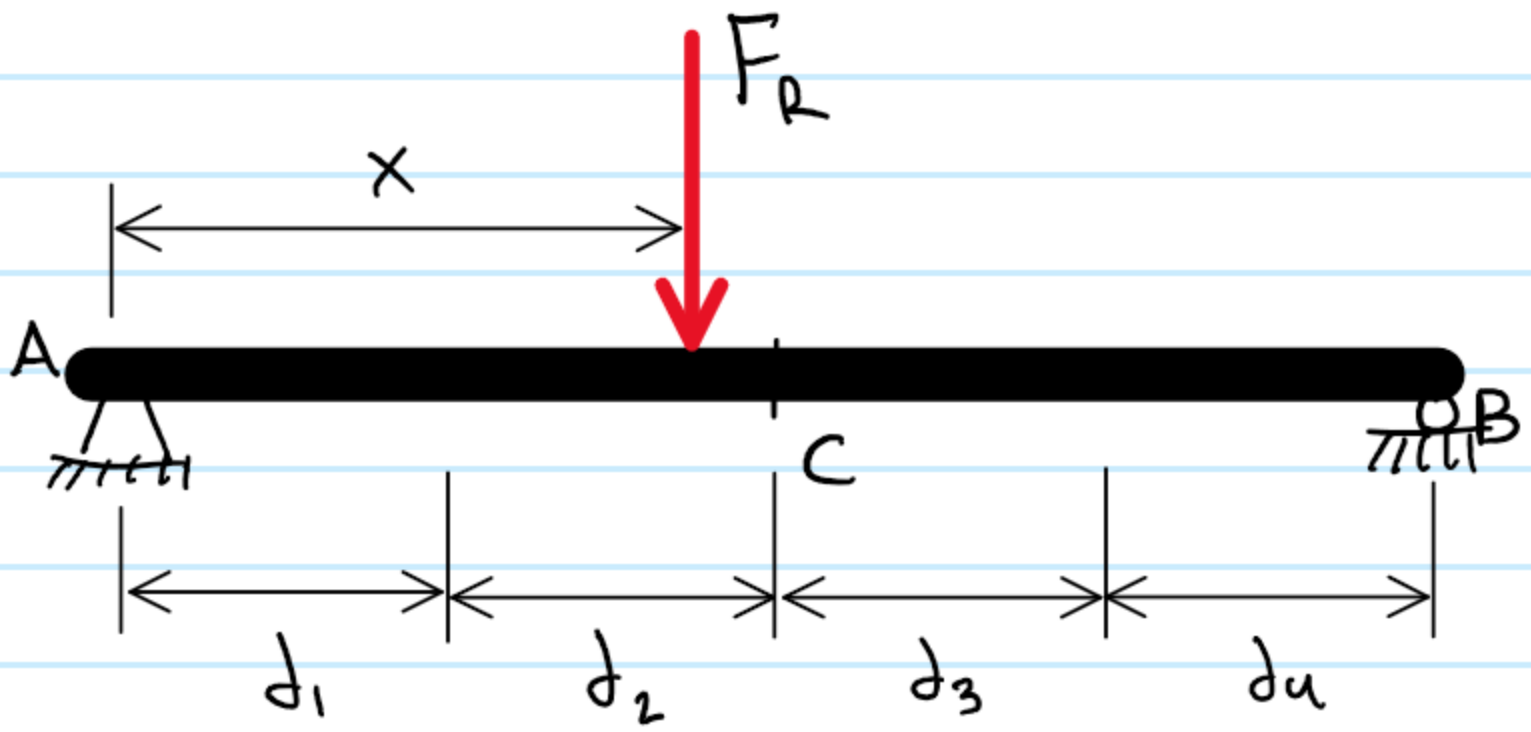
given $F_1, F_2, d_1, d_2, d_3, d_4$

find $F_R, x$




## Force Summation

$(F_R)_y = \Sigma F_y$: $F_{Ry} = -F_1 - F_2$ $F_R = |F_{Ry}|$




## Moment Summation

$$\circlearrowleft + (M_R)_A = \Sigma M_A: \quad -F_R x = -F_1(d_1) - F_2(d_1 + d_2 + d_3)$$

$$x = \frac{F_1(d_1) + F_2(d_1 + d_2 + d_3)}{F_R}$$