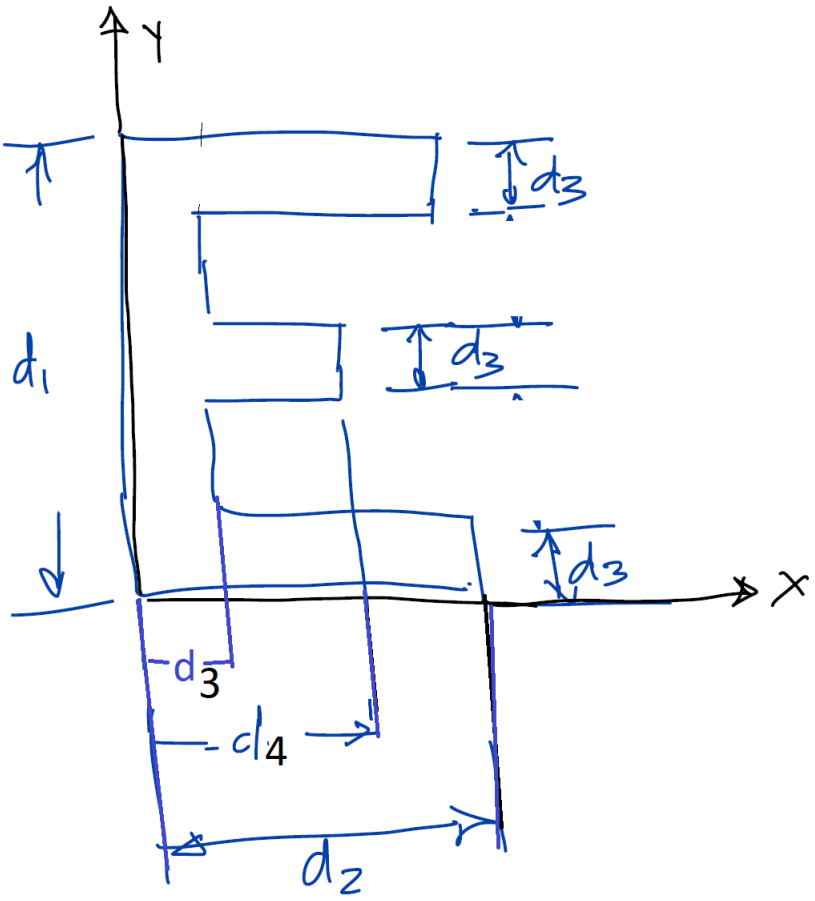
21-R-KIN-MS-48

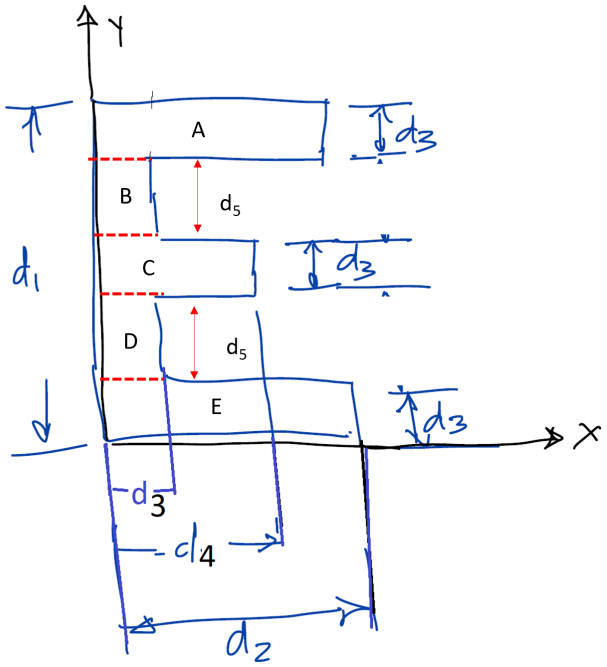


This E will be installed on an engineering building. Find its centroid.

$d_1 = 0.6m, d_2 = 0.4m, d_3 = 0.1m, d_4 = 0.25m$

Solution:

Divide the shape into composite rectangles:



$d_5 = d_1 - 3d_3$

Rectangle i	A	B	C	D	E
Area A_i	$d_2 d_3$	$d_3 d_3$	$d_3 d_4$	$d_5 d_3$	$d_2 d_3$
$\tilde{x}_i$	$\frac{d_2}{2}$	$\frac{d_3}{2}$	$\frac{d_4}{2}$	$\frac{d_3}{2}$	$\frac{d_2}{2}$
$\tilde{y}_i$	$d_1 - \frac{d_3}{2}$	$d_1 - d_3 - \frac{d_5}{2}$	$\frac{d_1}{2}$	$\frac{d_5}{2} + d_3$	$\frac{d_3}{2}$

$$\bar{x} = \frac{\sum \tilde{x}_i A_i}{\sum A_i} = \frac{\tilde{x}_A A_A + \tilde{x}_B A_B + \tilde{x}_C A_C + \tilde{x}_D A_D + \tilde{x}_E A_E}{A_A + A_B + A_C + A_D + A_E} = 0.146m$$

$$\bar{y} = \frac{\sum \tilde{y}_i A_i}{\sum A_i} = \frac{\tilde{y}_A A_A + \tilde{y}_B A_B + \tilde{y}_C A_C + \tilde{y}_D A_D + \tilde{y}_E A_E}{A_A + A_B + A_C + A_D + A_E} = 0.293m$$