

Să se determine poziția centrului de greutate pentru secțiunea hașurată din următoarele figuri:

Aplicația 1

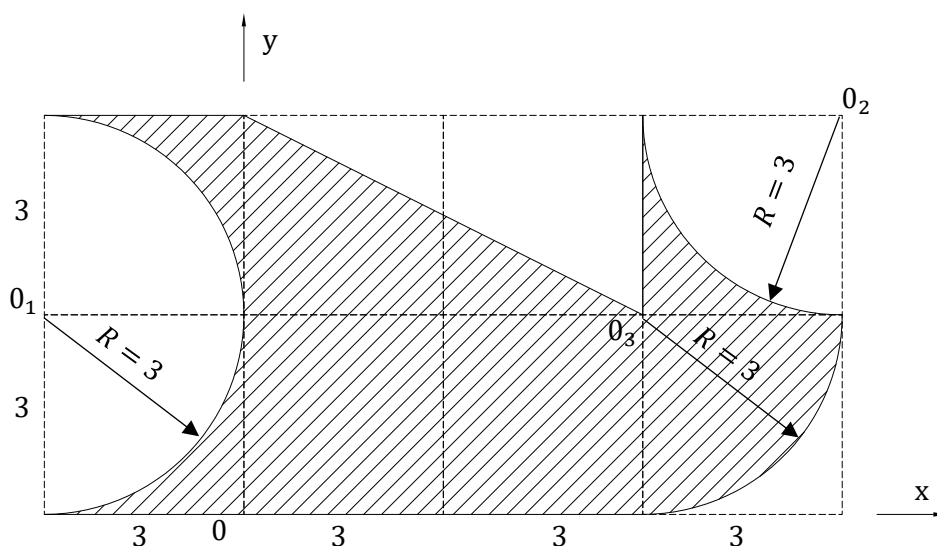


Figura 1 – Centre de masă

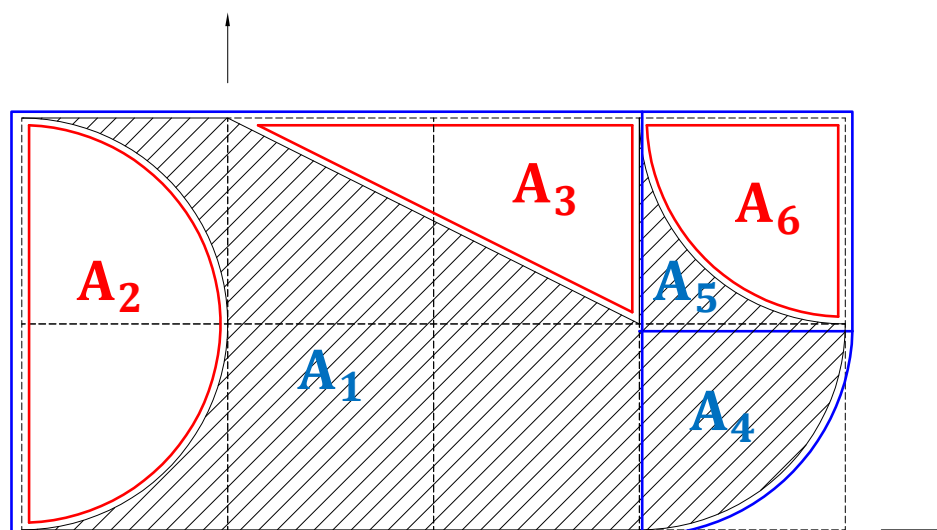


Figura 2 – Împărțirea în figuri elementare (simple)

Nr. crt.	A_i	x_i	y_i
1	54.00	1.50	3.00
2	-14.14	-1.73	3.00
3	-9.00	4.00	5.00
4	7.07	7.27	1.73
5	9.00	7.50	4.50
6	-7.07	7.73	4.73
$\sum arii$	39.86		

$$x_c = \frac{\sum A_i \cdot x_i}{A_i} = \frac{54 \cdot 1.50 + 14.14 \cdot 1.73 - 9 \cdot 4.00 + 7 \cdot 7.27 + 9 \cdot 7.50 - 7.07 \cdot 7.73}{39.86} = \frac{133.20}{39.86} = 3.34$$

$$y_c = \frac{\sum A_i \cdot y_i}{A_i} = \frac{54 \cdot 3.00 - 14.14 \cdot 3.00 - 9 \cdot 5.00 + 7 \cdot 1.73 + 9 \cdot 4.50 - 7.07 \cdot 4.73}{39.86} = \frac{93.75}{39.86} = 2.35$$

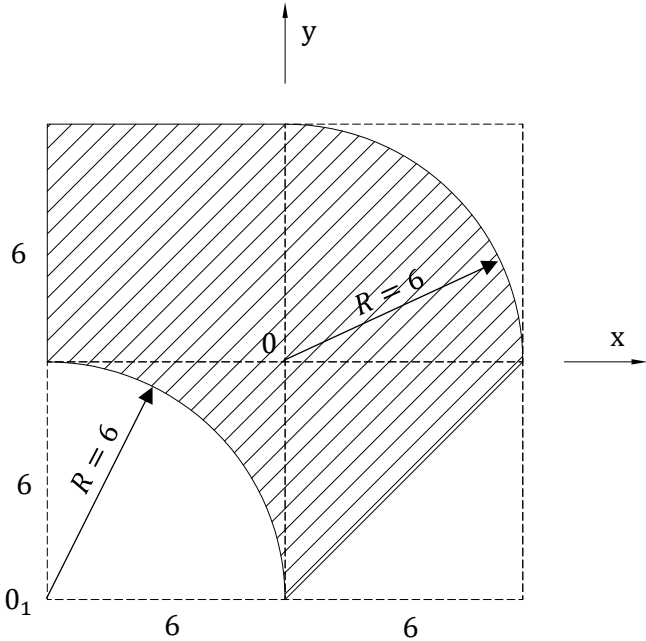


Figura 3 – Centre de masă

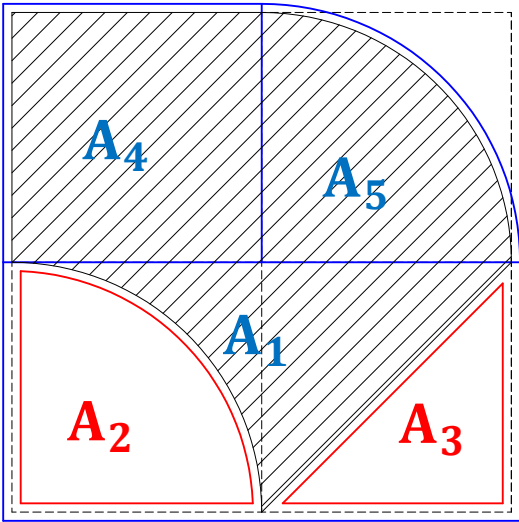


Figura 4 – Împărțirea în figuri elementare (simple)

Nr. crt.	A_i	x_i	y_i
1	72.00	0.00	-3.00
2	-28.27	-3.45	-3.45
3	-18.00	4.00	-4.00
4	36.00	-3.00	3.00
5	28.27	2.55	2.55
$\sum arii$	90.00		

$$x_c = \frac{\sum A_i \cdot x_i}{A_i} = \frac{72 \cdot 0.00 + 28.27 \cdot 3.45 - 18 \cdot 4 - 36 \cdot 3.00 + 28.27 \cdot 2.55}{90.00} = \frac{-10.38}{90.00} = -0.12$$

$$y_c = \frac{\sum A_i \cdot y_i}{A_i} = \frac{-72 \cdot 3.00 + 28.27 \cdot 3.45 + 18 \cdot 4.00 + 36 \cdot 3.00 + 28.27 \cdot 2.55}{90.00} = \frac{133.62}{90.00} = 1.48$$

Aplicația 3

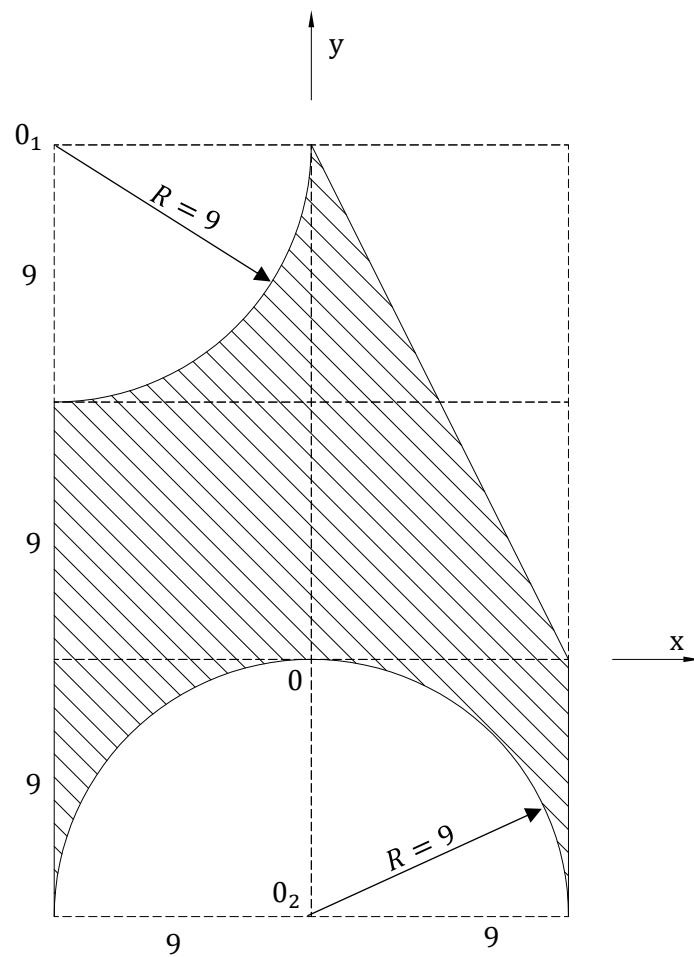


Figura 5 – Centre de masă

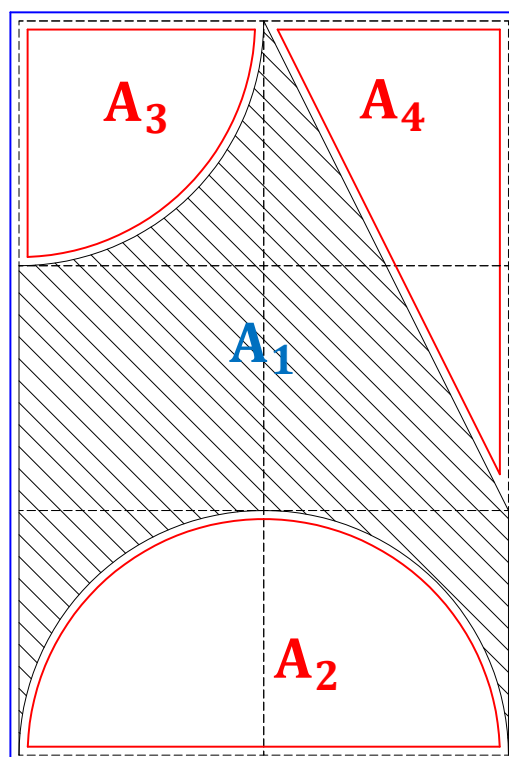


Figura 4 – Împărțirea în figuri elementare (simple)

Nr. crt.	A_i	x_i	y_i
1	486.00	0.00	4.50
2	-127.23	0.00	-5.18
3	-63.62	-5.18	14.18
4	-81.00	6.00	12.00
$\sum a_{rii}$	214.15		

$$x_c = \frac{\sum A_i \cdot x_i}{A_i} = \frac{486 \cdot 0.00 - 127.23 \cdot 0.00 + 63.62 \cdot 5.18 - 81 \cdot 6.00}{214.15} = \frac{-156.45}{214.15} = -0.73$$

$$y_c = \frac{\sum A_i \cdot y_i}{A_i} = \frac{486 \cdot 4.50 + 127.23 \cdot 5.18 - 63.62 \cdot 14.18 - 81 \cdot 12.00}{214.15} = \frac{971.92}{214.15} = 4.54$$