



Consider a letter “C”, which is obtained by cutting a large square plate of $(2a \times 2a)$ by an $(a \times a)$ -square. *Hint:* Let the small-open square be a hole in the large square.

Determine the x -coordinate of the center of mass, x_{cm} .

A)
$$x_{cm} = \frac{(2a)^2(a) + (-a^2) \left(\frac{3}{2}a\right)}{(2a)^2 + a^2}.$$

B)
$$x_{cm} = \frac{(2a)^2(a) + (-a)^2 \left(\frac{3}{2}a\right)}{(2a)^2 + a^2}.$$

C)
$$x_{cm} = \frac{(2a)^2(a) + (-a^2) \left(\frac{3}{2}a\right)}{(2a)^2 - a^2}.$$

The hole acts as a negative mass in the $(2a \times 2a)$ square.

$$x_{cm} = \frac{(2a)^2(a) + (-a^2)\left(\frac{3}{2}a\right)}{(2a)2 - a^2} = \frac{4a^3 - \frac{3}{2}a^3}{4a^2 - a^2} = \frac{\frac{5}{2}a^3}{3a^2} = \frac{5}{6}a.$$

Answer **C**.

09.06-02 Square Hole in Square 2004-3-24