Section 5.6:

Mass:
For a solid Q with density $\rho(x, y, z)$:

$$m = \iiint_Q \rho(x, y, z)\,\mathrm{d}V$$

For a lamina R with density $\rho(x, y)$:

$$m = \iint_R \rho(x, y)\,\mathrm{d}A$$

Center of mass:
For a solid Q with density $\rho(x, y, z)$: it is $(\bar{x}, \bar{y}, \bar{z})$ where

$$\bar{x} = \frac{\iiint_Q x\rho(x, y, z)\,\mathrm{d}V}{\iiint_Q \rho(x, y, z)\,\mathrm{d}V}, \quad \bar{y} = \frac{\iiint_Q y\rho(x, y, z)\,\mathrm{d}V}{\iiint_Q \rho(x, y, z)\,\mathrm{d}V}, \quad \bar{z} = \frac{\iiint_Q z\rho(x, y, z)\,\mathrm{d}V}{\iiint_Q \rho(x, y, z)\,\mathrm{d}V}$$

For a lamina R with density $\rho(x, y)$: it is $(\bar{x}, \bar{y})$ where

$$\bar{x} = \frac{\iint_R x\rho(x, y)\,\mathrm{d}A}{\iint_R \rho(x, y)\,\mathrm{d}A}, \quad \bar{y} = \frac{\iint_R y\rho(x, y)\,\mathrm{d}A}{\iint_R \rho(x, y)\,\mathrm{d}A}$$

Moments of inertia:
For a solid Q with density $\rho(x, y, z)$:

$$I_x = \iiint_Q (y^2 + z^2)\rho(x, y, z)\,\mathrm{d}V, \quad I_y = \iiint_Q (x^2 + z^2)\rho(x, y, z)\,\mathrm{d}V$$

$$I_z = \iiint_Q (x^2 + y^2)\rho(x, y, z)\,\mathrm{d}V$$

For a lamina R with density $\rho(x, y)$:

$$I_x = \iint_R y^2\rho(x, y)\,\mathrm{d}A, \quad I_y = \iint_R x^2\rho(x, y)\,\mathrm{d}A$$

$$I_0 = \iint_R (x^2 + y^2)\rho(x, y)\,\mathrm{d}A = I_x + I_y$$