<center>Formula for the Centroid of R</center>

The area is
$$A = \int\int_R dxdy = \int\int_R dydx.$$

The centroid is the centre of mass if mass on R is uniformly distributed. The formula for the centroid is
$$(\overline{x}, \overline{y}),$$

where
$$\overline{x} = \frac{1}{A}\int\int_R xdxdy = \frac{1}{A}\int\int_R xdydx,$$

and
$$\overline{y} = \frac{1}{A}\int\int_R ydxdy = \frac{1}{A}\int\int_R ydydx.$$

<center>Formula for the centre of mass with density $\rho(x,y)$.</center>

If the mass has density $\rho(x,y)$, the *weight* of R is
$$W = \int\int_R \rho(x,y)dxdy = \int\int_R \rho(x,y)dydx.$$

The formula for the centre of mass is
$$(\overline{x}, \overline{y}),$$

where
$$\overline{x} = \frac{1}{W}\int\int_R x\rho(x,y)dxdy = \frac{1}{W}\int\int_R x\rho(x,y)dydx,$$

and
$$\overline{y} = \frac{1}{W}\int\int_R y\rho(x,y)dxdy = \frac{1}{W}\int\int_R y\rho(x,y)dydx.$$

<center>1</center>