

Problem: Compute the mass center of the triangular plate with vertices $(0, 0)$, $(1, 0)$, and $(0, 1)$ and density function $\rho(x, y) = 1 + x + y$.

with(plots);

[Interactive, animate, animate3d, animatecurve, arrow, changecoords, complexplot, (1)

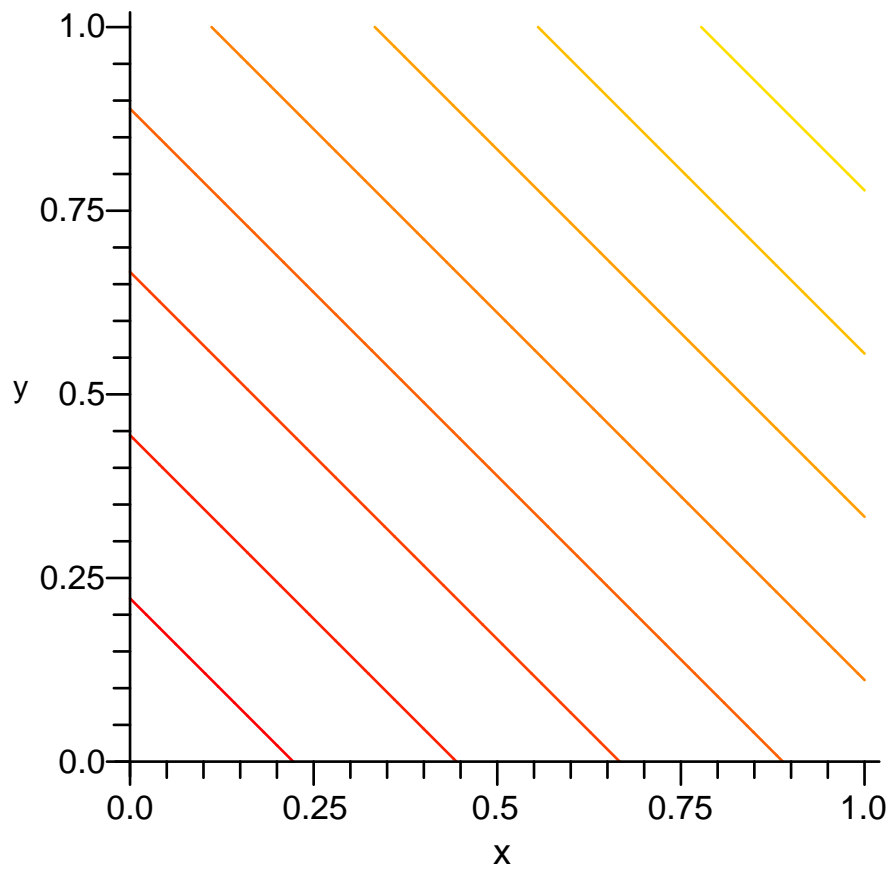
complexplot3d, conformal, conformal3d, contourplot, contourplot3d, coordplot, coordplot3d, cylinderplot, densityplot, display, display3d, fieldplot, fieldplot3d, gradplot, gradplot3d, graphplot3d, implicitplot, implicitplot3d, inequal, interactive, interactiveparams, listcontplot, listcontplot3d, listdensityplot, listplot, listplot3d, loglogplot, logplot, matrixplot, multiple, odeplot, pareto, plotcompare, pointplot, pointplot3d, polarplot, polygonplot, polygonplot3d, polyhedra_supported, polyhedraplot, replot, rootlocus, semilogplot, setoptions, setoptions3d, spacecurve, sparsematrixplot, sphereplot, surfdata, textplot, textplot3d, tubeplot]

$\rho := (x, y) \rightarrow 1 + x + y;$

$(x, y) \rightarrow 1 + x + y$

(2)

contourplot($\rho(x, y)$, $x = 0..1$, $y = 0..1$);



$$m := \text{int}(\text{int}(\rho(x, y), x = 0..1 - y), y = 0..1); \quad (3)$$

$$\frac{5}{6} \quad (4)$$

$$xbar := \frac{1}{m} \cdot \text{int}(\text{int}(x \cdot \rho(x, y), x = 0..1 - y), y = 0..1);$$

$$\frac{7}{20} \quad (5)$$

$$ybar := \frac{1}{m} \cdot \text{int}(\text{int}(y \cdot \rho(x, y), x = 0..1 - y), y = 0..1);$$

$$\frac{7}{20} \quad (6)$$

Answer: The mass center has coordinates $(7/20, 7/20)$.