## **Divergence**

Idea:

Convert Vector field  $ec{F}(x,y,z) = (P,Q,R): R^n o R^n$  to a number.

$$abla \cdot ec{F} = \left( rac{\partial P}{\partial x} + rac{\partial Q}{\partial y} + rac{\partial R}{\partial z} 
ight)$$

(see: Nabla)

## **Geometric Intuition**

 $\frac{\partial P}{\partial x}>0$  and  $\frac{\partial Q}{\partial y}>0$  should contribute to an outward expansion.

 $rac{\partial P}{\partial x} < 0$  and  $rac{\partial Q}{\partial y} < 0$  should contribute to an inward contraction.

# 
$$abla \cdot (
abla imes ec{F}) = 0$$

(see: Curl)

Clairaut's Theorem