Divergence theorem. In two dimensions, it is equivalent to Green's theorem

$$\int_{V} \partial F = \int_{\partial V} F$$

volume integral
$$\iiint_V \left(
abla \cdot \mathbf{F} \right) \, dV = \oiint_S \left(\mathbf{F} \cdot \mathbf{n} \right) dS.$$
 surface integral

Name	Integral equations	Differential equations
Gauss's law	$rac{ ext{surface}}{ ext{integral}} \qquad \iint_{\partial\Omega} \mathbf{E} \cdot \mathrm{d}\mathbf{S} = 4\pi \iiint_{\Omega} ho \mathrm{d}V \qquad rac{ ext{volume}}{ ext{integral}}$	$ abla \cdot {f E} = 4\pi ho$
Gauss's law for magnetism	$\iint_{\partial\Omega}\mathbf{B}\cdot\mathrm{d}\mathbf{S}=0$	$ abla \cdot {f B} = 0$
Maxwell–Faraday equation (Faraday's law of induction)	$\oint \int_{\partial \Sigma} \mathbf{E} \cdot \mathrm{d}oldsymbol{\ell} = -rac{1}{c} rac{\mathrm{d}}{\mathrm{d}t} \iint_{\Sigma} \mathbf{B} \cdot \mathrm{d}\mathbf{S}$	$ abla imes \mathbf{E} = -rac{1}{c}rac{\partial \mathbf{B}}{\partial t}$
Ampère's circuital law (with Maxwell's addition)	$\oint \int_{\partial \Sigma} \mathbf{B} \cdot \mathrm{d}oldsymbol{\ell} = rac{1}{c} \left(4\pi \iint_{\Sigma} \mathbf{J} \cdot \mathrm{d}\mathbf{S} + rac{\mathrm{d}}{\mathrm{d}t} \iint_{\Sigma} \mathbf{E} \cdot \mathrm{d}\mathbf{S} ight)$	$ abla imes {f B} = rac{1}{c}\left(4\pi {f J} + rac{\partial {f E}}{\partial t} ight)$

Conservative Forces: if F=- ∇U

$$F = -\nabla U \qquad \int_a^b F = \int_a^b -\nabla U = -U_b + U_a = \Delta U_{ab}$$
 Independent of path

Maxwell's Eq = Wave Eq L
$\nabla \circ E = P$ $\nabla \times E = \frac{\partial B}{\partial t} + \emptyset$
V.B=0
VXB= DE + MOI
at
Homework for students:
Report with all No Eo to Find C
in terms of 110 Eo
In Vacoum: P-PO I >0
$\nabla X \left(\nabla X E = \frac{2B}{2E} \right) = \nabla \nabla^2 E = \frac{2}{2E} \left(\nabla X B \right)$
$=\frac{2}{2t}\left(\frac{2t}{3t}\right)=\frac{\lambda E}{2t^2}$
P VE= JE
Likewise VB= 27B
Likewise VIS= 2 B