$$\int \boldsymbol{\nabla} \cdot \mathbf{E} \; dV = \oint \mathbf{E} \cdot \hat{\mathbf{n}} \; dA$$

Calculate both sides of the above equation confirming the equality that is Gauss's Law. Use as the volume a unit cube with diagonal between $(0,0,0)$ and $(1,1,1)$. Note that the boundary of the cube (which is the surface of the surface integral) includes six faces, so the rhs of the above is the sum of six face integrals (many of which are zero),

1. Check the above for $\mathbf{E} = (x, y, 0)$

2. Check the above for $\mathbf{E} = (x^2, 0, 0)$