IP[y]: Notebook

simple_ga_test

Save QuickHelp

In [1]:
```
from printer import  Format
from ga import Ga
from sympy import symbols
```

In [2]:
```
Format(ipy=True)
```

In [3]:
```
coords = (x,y,z) = symbols('x,y,z',real=True)
(o3d,ex,ey,ez) = Ga.build('e_x e_y e_z',g=[1,1,1],coords=coords)
```

In [4]:
```
v = o3d.mv('v','vector')
```

In [5]:
```
v.Fmt(3,'v')
```

$$v = v^{x}\boldsymbol{e_x} + v^{y}\boldsymbol{e_y} + v^{z}\boldsymbol{e_z}$$

In [6]:
```
V = o3d.mv('V','vector',f=True)
```

In [7]:
```
V.Fmt()
```

$$V^{x}\boldsymbol{e_x} + V^{y}\boldsymbol{e_y} + V^{z}\boldsymbol{e_z}$$

In [8]:
```
gradV = o3d.grad*V
```

In [9]:
```
gradV.Fmt(3,r'\nabla V')
```

$$\begin{aligned}\nabla V = &\left(\partial_{x}V^{x} + \partial_{y}V^{y} + \partial_{z}V^{z}\right) \\ &+\left(-\partial_{y}V^{x} + \partial_{x}V^{y}\right)\boldsymbol{e_x}\wedge\boldsymbol{e_y} \\ &+\left(-\partial_{z}V^{x} + \partial_{x}V^{z}\right)\boldsymbol{e_x}\wedge\boldsymbol{e_z} \\ &+\left(-\partial_{z}V^{y} + \partial_{y}V^{z}\right)\boldsymbol{e_y}\wedge\boldsymbol{e_z}\end{aligned}$$

In [10]:
```
gradV.Fmt(2,r'\nabla V')
```

$$\nabla V = \left(\partial_{x}V^{x} + \partial_{y}V^{y} + \partial_{z}V^{z}\right) + \left(-\partial_{y}V^{x} + \partial_{x}V^{y}\right)\boldsymbol{e_x}\wedge\boldsymbol{e_y} + \left(-\partial_{z}V^{x} + \partial_{x}V^{z}\right)\boldsymbol{e_x}\wedge\boldsymbol{e_z} + \left(-\partial_{z}V^{y} + \partial_{y}V^{z}\right)\boldsymbol{e_y}\wedge\boldsymbol{e_z}$$

In [11]:
```
lap = o3d.grad|o3d.grad
```

In [12]:
```
lap.Fmt(1,'\\nabla^{2}')
```

$$\nabla^{2} = \frac{\partial^{2}}{\partial x^{2}} + \frac{\partial^{2}}{\partial y^{2}} + \frac{\partial^{2}}{\partial z^{2}}$$

In [13]:
```
A = o3d.lt('A')
```

In [14]:
```
A.Fmt(1,'A')
```

$$A = \left\{\begin{aligned}L(\boldsymbol{e_x}) &= A_{xx}\boldsymbol{e_x} + A_{yx}\boldsymbol{e_y} + A_{zx}\boldsymbol{e_z} \\ L(\boldsymbol{e_y}) &= A_{xy}\boldsymbol{e_x} + A_{yy}\boldsymbol{e_y} + A_{zy}\boldsymbol{e_z} \\ L(\boldsymbol{e_z}) &= A_{xz}\boldsymbol{e_x} + A_{yz}\boldsymbol{e_y} + A_{zz}\boldsymbol{e_z}\end{aligned}\right\}$$

In [ ]:
```

```