In[110]:=
```
f = Exp[x / 3] * (x^2 + 3 * y^2 - 2 * y * z - z^2 + z - y + 5)
```

Out[110]=
$$e^{x/3}\left(5 + x^2 - y + 3\,y^2 + z - 2\,y\,z - z^2\right)$$

In[111]:=
```
gradijent = D[f, {{x, y, z}}]
```

Out[111]=
$$\left\{2\,e^{x/3}\,x + \frac{1}{3}\,e^{x/3}\left(5 + x^2 - y + 3\,y^2 + z - 2\,y\,z - z^2\right),\ e^{x/3}\,(-1 + 6\,y - 2\,z),\ e^{x/3}\,(1 - 2\,y - 2\,z)\right\}$$

In[112]:=
```
Tacke = Solve[gradijent == 0, {x, y, z}]
```

Out[112]=
$$\left\{\left\{x \to -5,\ y \to \frac{1}{4},\ z \to \frac{1}{4}\right\},\ \left\{x \to -1,\ y \to \frac{1}{4},\ z \to \frac{1}{4}\right\}\right\}$$

In[113]:=
```
Hodf = Simplify[D[f, {{x, y, z}, 2}]]
```

Out[113]=
$$\left\{\left\{\frac{1}{9}\,e^{x/3}\left(23 + 12\,x + x^2 + 3\,y^2 + z - z^2 - y\,(1 + 2\,z)\right),\right.\right.$$
$$\frac{1}{3}\,e^{x/3}\,(-1 + 6\,y - 2\,z),\ -\frac{1}{3}\,e^{x/3}\,(-1 + 2\,y + 2\,z)\Big\},$$
$$\left\{\frac{1}{3}\,e^{x/3}\,(-1 + 6\,y - 2\,z),\ 6\,e^{x/3},\ -2\,e^{x/3}\right\},\ \left\{-\frac{1}{3}\,e^{x/3}\,(-1 + 2\,y + 2\,z),\ -2\,e^{x/3},\ -2\,e^{x/3}\right\}\Big\}$$

In[114]:=
```
HodfM = MatrixForm[Hodf]
```

Out[114]//MatrixForm=
$$\begin{pmatrix} \frac{1}{9}\,e^{x/3}\left(23 + 12\,x + x^2 + 3\,y^2 + z - z^2 - y\,(1 + 2\,z)\right) & \frac{1}{3}\,e^{x/3}\,(-1 + 6\,y - 2\,z) & -\frac{1}{3}\,e^{x/3}\,(-1 + 2\,y + 2\,z) \\ \frac{1}{3}\,e^{x/3}\,(-1 + 6\,y - 2\,z) & 6\,e^{x/3} & -2\,e^{x/3} \\ -\frac{1}{3}\,e^{x/3}\,(-1 + 2\,y + 2\,z) & -2\,e^{x/3} & -2\,e^{x/3} \end{pmatrix}$$

In[115]:=
```
HodfuTacke = Hodf /. Tacke
```

Out[115]=
$$\left\{\left\{\left\{-\frac{4}{3\,e^{5/3}},\ 0,\ 0\right\},\ \left\{0,\ \frac{6}{e^{5/3}},\ -\frac{2}{e^{5/3}}\right\},\ \left\{0,\ -\frac{2}{e^{5/3}},\ -\frac{2}{e^{5/3}}\right\}\right\},\right.$$
$$\left.\left\{\left\{\frac{4}{3\,e^{1/3}},\ 0,\ 0\right\},\ \left\{0,\ \frac{6}{e^{1/3}},\ -\frac{2}{e^{1/3}}\right\},\ \left\{0,\ -\frac{2}{e^{1/3}},\ -\frac{2}{e^{1/3}}\right\}\right\}\right\}$$

In[116]:=
```
minf = Map[PositiveDefiniteMatrixQ, HodfuTacke, 1]
```

Out[116]=
```
{False, False}
```

In[117]:=
```
maxf = Map[PositiveDefiniteMatrixQ, -HodfuTacke, 1]
```

Out[117]=
```
{False, False}
```