In[1]:=
```
Clear["Global`*"]
```

In[2]:=
```
SetDirectory["/Users/kevin/papers/math/GRcode"]
```

Out[2]=
```
/Users/kevin/papers/math/GRcode
```

In[3]:=
```
<< GREAT.m
```

```
GREAT functions are: IMetric, Christoffel,
  Riemann, Ricci, SCurvature, EinsteinTensor, SqRicci, SqRiemann.

Enter 'helpGREAT' for this list of functions
```

In[4]:=
```
x = {t, r, theta, phi}
```

Out[4]=
```
{t, r, theta, phi}
```

In[7]:=
```
(g = {{-(1 - 2 * M * G / (c^2 * r)) * c^2, 0, 0, 0}, {0, 1 / (1 - 2 * M * G / (c^2 * r)), 0, 0},
    {0, 0, r^2, 0}, {0, 0, 0, r^2 * Sin[theta]^2}}) // MatrixForm
```

Out[7]//MatrixForm=

$$\begin{pmatrix} c^2\left(-1+\frac{2GM}{c^2 r}\right) & 0 & 0 & 0 \\ 0 & \frac{1}{1-\frac{2GM}{c^2 r}} & 0 & 0 \\ 0 & 0 & r^2 & 0 \\ 0 & 0 & 0 & r^2\,\text{Sin}[\text{theta}]^2 \end{pmatrix}$$

In[8]:=
```
SCurvature[g, x]
```

Out[8]=
```
0
```

In[9]:=
```
Ricci[g, x]
```

Out[9]=
```
{{0, 0, 0, 0}, {0, 0, 0, 0}, {0, 0, 0, 0}, {0, 0, 0, 0}}
```

In[10]:=
```
Christoffel[g, x]
```

Out[10]=

$$\left\{\left\{\left\{0, \frac{GM}{r\left(-2GM+c^2 r\right)}, 0, 0\right\}, \left\{\frac{GM}{r\left(-2GM+c^2 r\right)}, 0, 0, 0\right\}, \{0,0,0,0\}, \{0,0,0,0\}\right\},\right.$$
$$\left\{\left\{\frac{GM\left(1-\frac{2GM}{c^2 r}\right)}{r^2}, 0, 0, 0\right\}, \left\{0, \frac{GM}{2GMr-c^2 r^2}, 0, 0\right\},\right.$$
$$\left.\left\{0, 0, \frac{2GM}{c^2}-r, 0\right\}, \left\{0, 0, 0, \frac{\left(2GM-c^2 r\right)\text{Sin}[\text{theta}]^2}{c^2}\right\}\right\},$$
$$\left\{\{0,0,0,0\}, \left\{0, 0, \frac{1}{r}, 0\right\}, \left\{0, \frac{1}{r}, 0, 0\right\}, \{0,0,0,-\text{Cos}[\text{theta}]\,\text{Sin}[\text{theta}]\}\right\},$$
$$\left.\left\{\{0,0,0,0\}, \left\{0, 0, 0, \frac{1}{r}\right\}, \{0,0,0,\text{Cot}[\text{theta}]\}, \left\{0, \frac{1}{r}, \text{Cot}[\text{theta}], 0\right\}\right\}\right\}$$