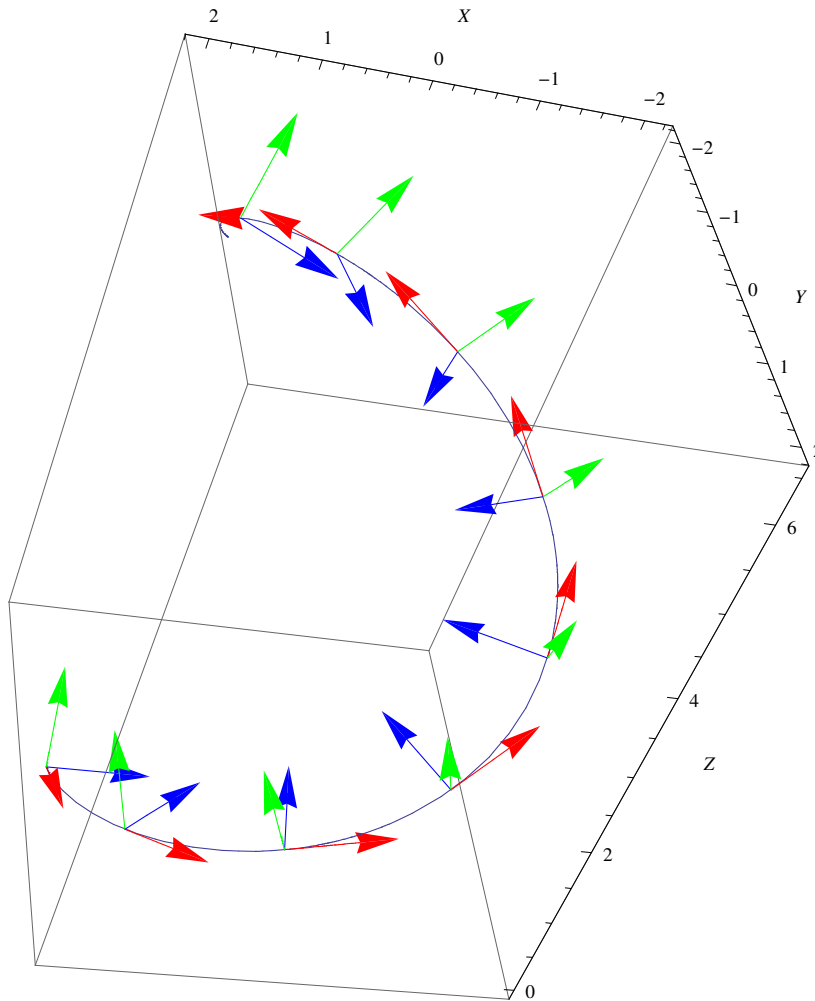


```

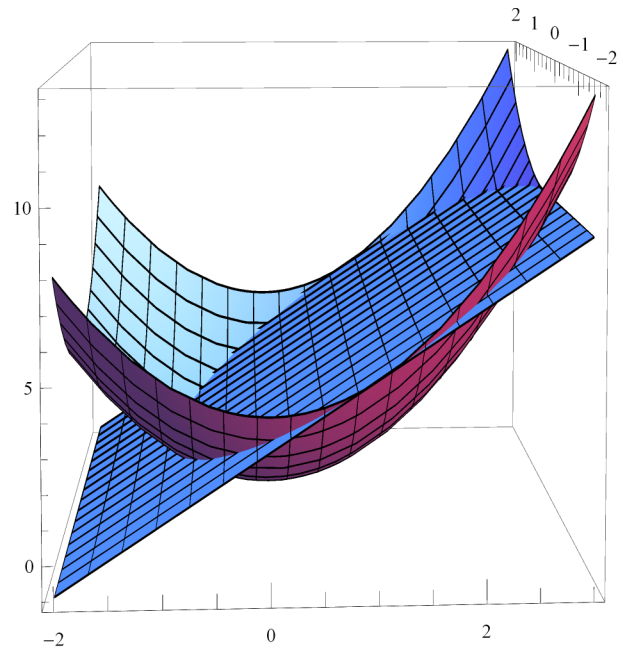
In[1]:= r[t_] := {2 Cos[t], 2 Sin[t], t}
In[2]:= a = ParametricPlot3D[r[t], {t, 0, 2 Pi}, AxesLabel -> {X, Y, Z}];
In[3]:= T[t_] := {r[t], r[t] + r'[t] / Norm[r'[t]]}
In[4]:= n[t_] := {r[t], r[t] + r''[t] / Norm[r''[t]]}
In[5]:= B[t_] := {r[t], r[t] + Cross[r'[t], r''[t]] / Norm[Cross[r'[t], r''[t]]]}
In[6]:= Sys[t_] := {{Red, Arrow[T[t]]}, {Blue, Arrow[n[t]]}, {Green, Arrow[B[t]]}}
In[7]:= b = Graphics3D[Table[Sys[t], {t, 0, 2 Pi, 0.7}]];
In[8]:= Show[a, b, PlotRange -> All]

```

Out[8]=

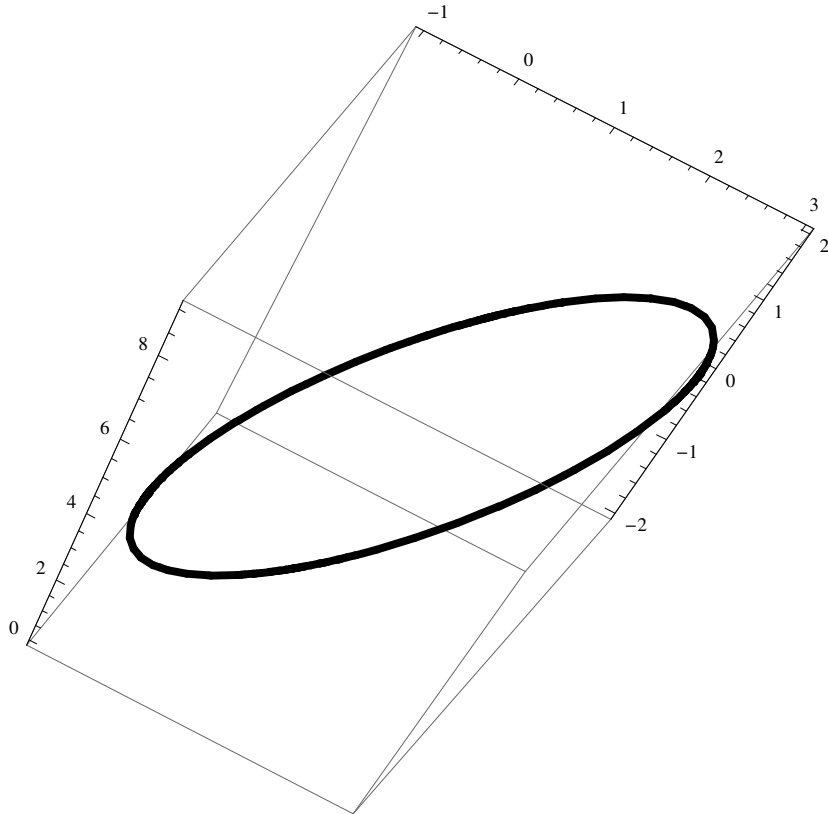


```
In[19]:= Plot3D[{x^2 + y^2, 2 x + 3}, {x, -2, 3}, {y, -2, 2}, AspectRatio -> 1]
```



Out[19]=

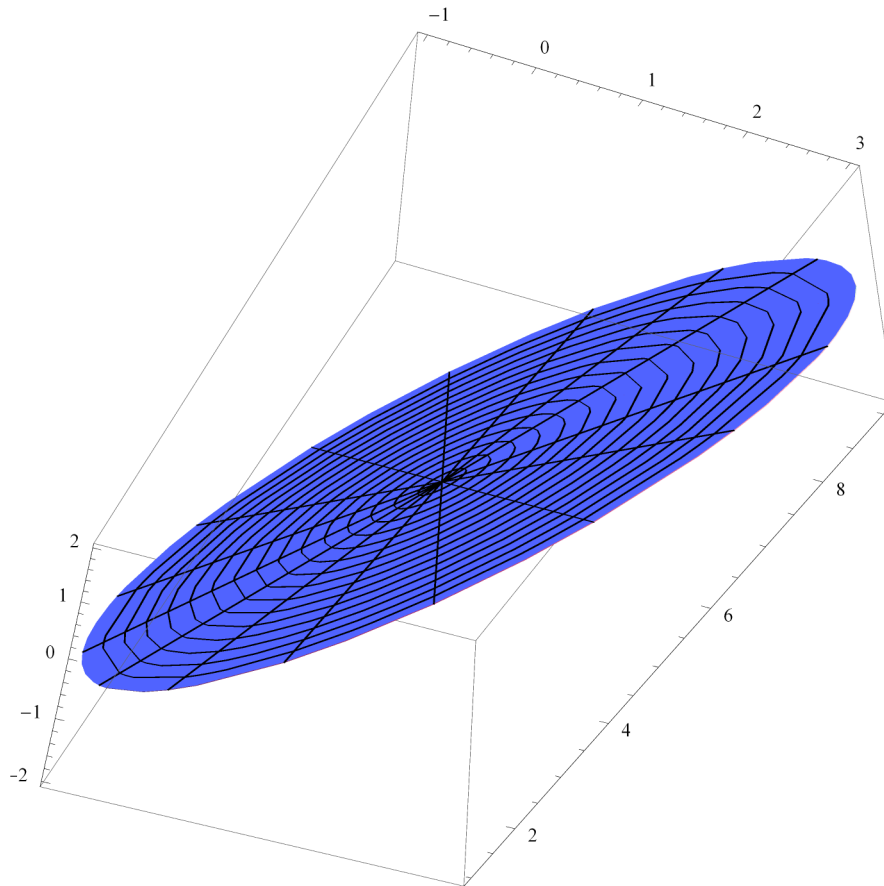
```
In[20]:= a = ParametricPlot3D[{2 Cos[t] + 1, 2 Sin[t], 4 Cos[t] + 5},  
  {t, 0, 2 Pi}, AspectRatio -> 1, PlotStyle -> {Thickness[0.01]}]
```



Out[20]=

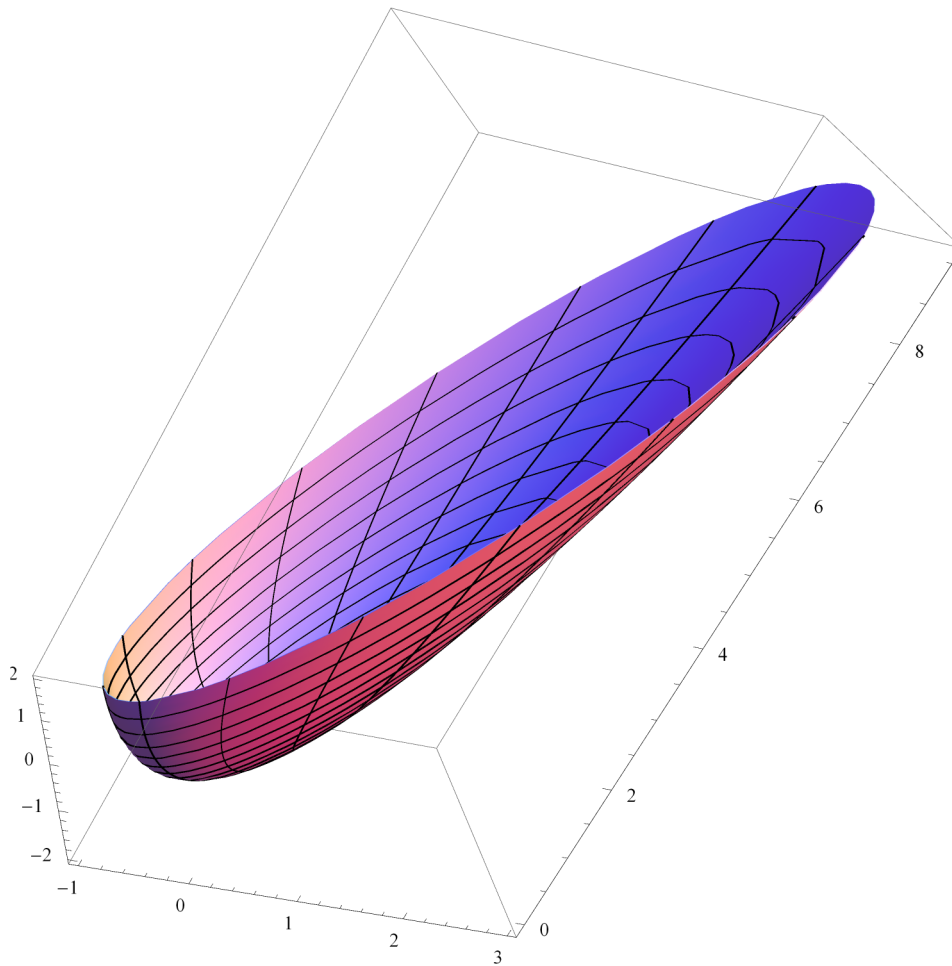
```
In[21]:= b = ParametricPlot3D[{r Cos[t] + 1, r Sin[t], 2 r Cos[t] + 5},
  {t, 0, 2 Pi}, {r, 0, 2}, AspectRatio -> 1, PlotStyle -> {Thickness[0.01]}
```

Out[21]=



```
In[22]:= c = ParametricPlot3D[{r Cos[t] + 1, r Sin[t], 2 r Cos[t] + 1 + r^2},
  {t, 0, 2 Pi}, {r, 0, 2}, AspectRatio -> 1, PlotStyle -> {Thickness[0.01]}
```

Out[22]=



$$\text{In[1]:= } f[z_] := \frac{1}{(z-1)(z-2)^2}$$

```
In[2]:= Series[1 / ((z - 1) (z - 2) ^ 2), {z, 0, 20}]
```

$$\text{Out[2]= } \frac{1}{4} z^2 - \frac{11}{16} z^3 + \frac{13}{16} z^4 - \frac{57}{64} z^5 + \frac{15}{16} z^6 - \frac{247}{256} z^7 + \frac{251}{256} z^8 - \frac{1013}{1024} z^9 + \frac{509}{512} z^{10} - \frac{4083}{4096} z^{11} + \frac{4089}{4096} z^{12} - \frac{16369}{16384} z^{13} + \frac{2047}{2048} z^{14} - \frac{65519}{65536} z^{15} + \frac{65527}{65536} z^{16} - \frac{262125}{262144} z^{17} + \frac{131067}{131072} z^{18} - \frac{1048555}{1048576} z^{19} + \frac{1048565}{1048576} z^{20} - \frac{4194281}{4194304} z^{21} + O[z]^{21}$$

$$\text{In[3]:= } A := \frac{1}{4} z^2 - \frac{11}{16} z^3 + \frac{13}{16} z^4 - \frac{57}{64} z^5 + \frac{15}{16} z^6 - \frac{247}{256} z^7 + \frac{251}{256} z^8 - \frac{1013}{1024} z^9 + \frac{509}{512} z^{10} - \frac{4083}{4096} z^{11} + \frac{4089}{4096} z^{12} - \frac{16369}{16384} z^{13} + \frac{2047}{2048} z^{14} - \frac{65519}{65536} z^{15} + \frac{65527}{65536} z^{16} - \frac{262125}{262144} z^{17} + \frac{131067}{131072} z^{18} - \frac{1048555}{1048576} z^{19} + \frac{1048565}{1048576} z^{20} - \frac{4194281}{4194304} z^{21}$$

```
In[4]:= 1 + CoefficientList[A, z]
```

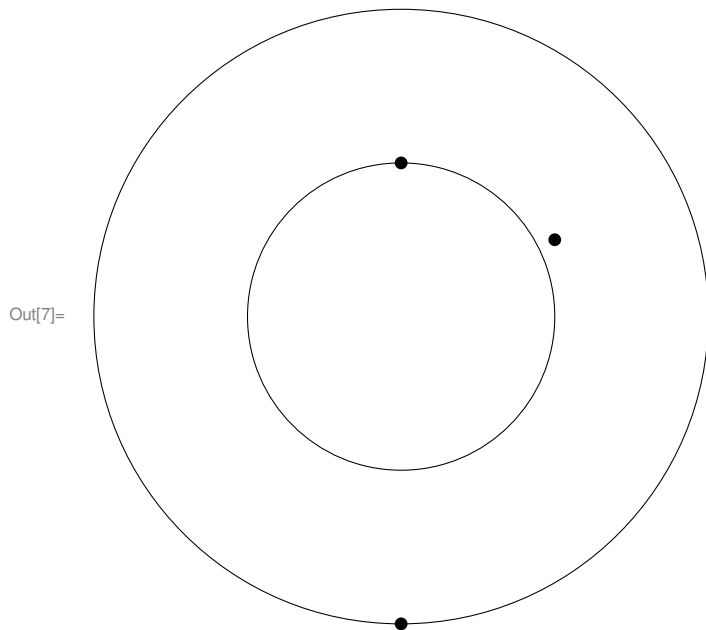
$$\text{Out[4]= } \left\{ \frac{3}{4}, \frac{1}{2}, \frac{5}{16}, \frac{3}{16}, \frac{7}{64}, \frac{1}{16}, \frac{9}{256}, \frac{5}{256}, \frac{11}{1024}, \frac{3}{512}, \frac{13}{4096}, \frac{7}{4096}, \frac{15}{16384}, \frac{1}{2048}, \frac{17}{65536}, \frac{9}{65536}, \frac{19}{262144}, \frac{5}{131072}, \frac{21}{1048576}, \frac{11}{1048576}, \frac{23}{4194304} \right\}$$

$$\text{In[5]:= } g[z_, n_] := \sum_{k=-n}^{-1} z^k + \sum_{k=0}^n \frac{k+3}{2^{k+2}} z^k$$

```
In[6]:= {f[1.5], g[1.5, 30]}
```

$$\text{Out[6]= } \{8., 7.99503\}$$

```
In[7]:= Graphics[{Circle[{0, 0}, 1], Circle[{0, 0}, 2],
  {PointSize[0.02], {Point[{1, 0.5}], Point[{0, 1}], Point[{0, -2}]}}]}
```



```
In[8]:= N[{f[1 + 0.5 I], g[1 + 0.5 I, 100]}]
```

$$\text{Out[8]= } \{1.28 - 0.96 i, 1.28002 - 0.960021 i\}$$

```
In[9]:= N[{f[0 + I], g[0 + I, 10000]}]
```

$$\text{Out[9]= } \{0.02 - 0.14 i, 0.52 + 0.36 i\}$$

```
In[10]:= N[{f[0 - 2 I], g[0 - 2 I, 10000]}]
```

$$\text{Out[10]= } \{0.05 + 0.025 i, 1250.55 + 1250.4 i\}$$

$$\text{In}[16]:= \int_0^{2\pi} \frac{\text{Cos}[x]}{2 + \text{Cos}[x]} dx$$

$$\text{Out}[16]= \left(2 - \frac{4}{\sqrt{3}}\right) \pi$$

$$\text{In}[17]:= \int_0^{\infty} \frac{1}{1 + x^4} dx$$

$$\text{Out}[17]= \frac{\pi}{2\sqrt{2}}$$

$$\text{In}[18]:= \int_0^{\infty} \frac{\text{Sin}[x]}{x(1 + x^2)} dx$$

$$\text{Out}[18]= \frac{(-1 + e) \pi}{2e}$$

$$\text{In}[19]:= \int_0^{\infty} \frac{\sqrt{x}}{(1 + x)^2} dx$$

$$\text{Out}[19]= \frac{\pi}{2}$$