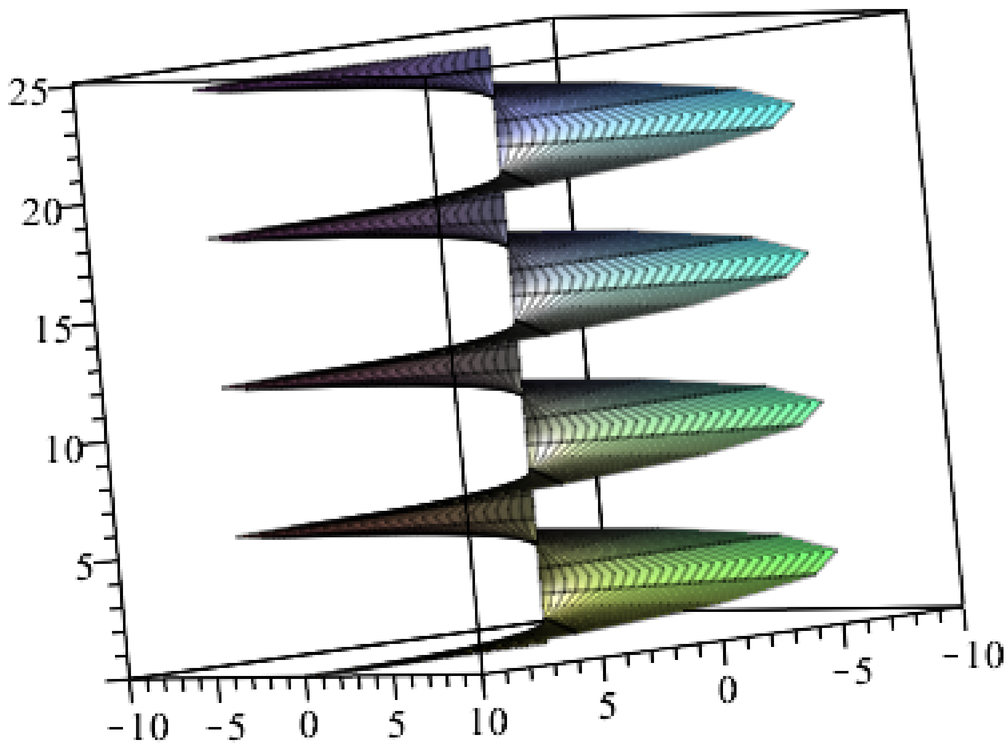
Graphs for #s 13 - 18, Section 16.6

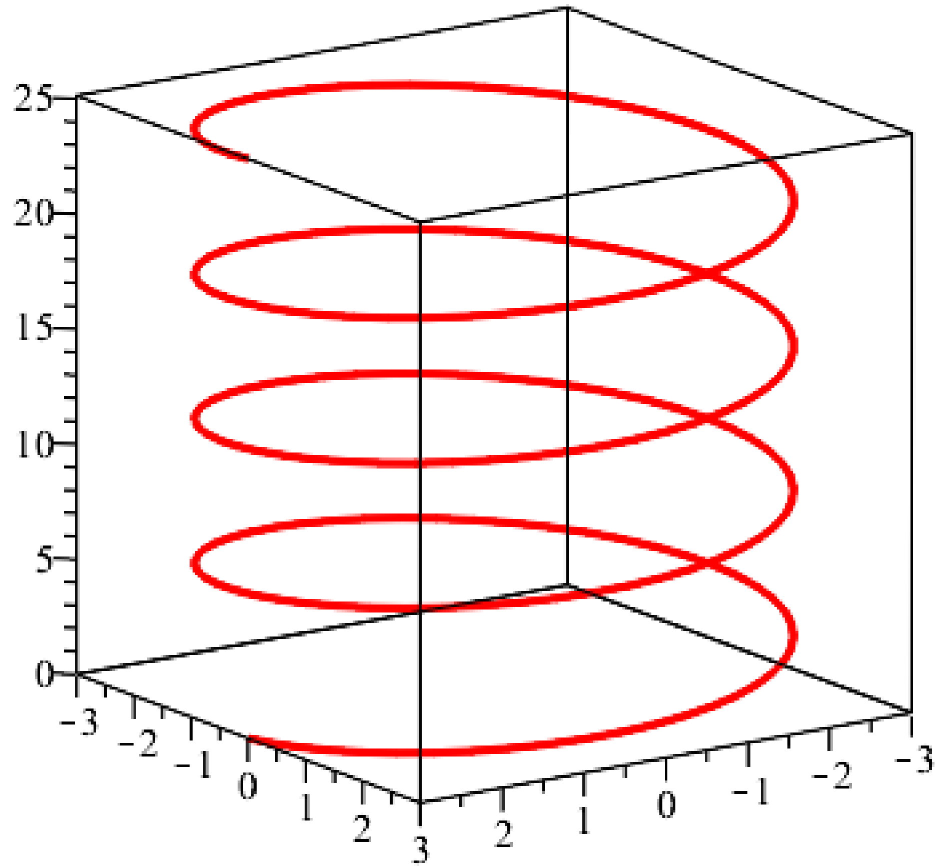
$r13 := (u, v) \to \langle u \cdot \cos(v), u \cdot \sin(v), v \rangle$

$$r13 := (u, v) \mapsto \langle u \cos(v), u \sin(v), v \rangle \quad (1.1)$$

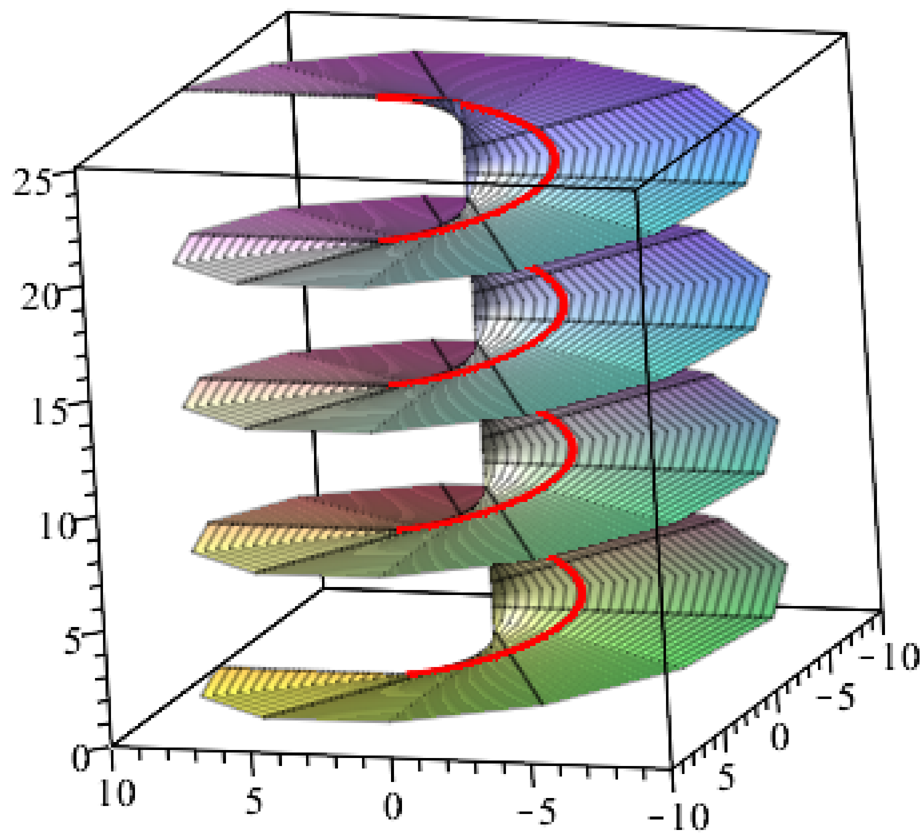
$r13plot := plot3d(r13(u, v), u = 0 ..10, v = 0 ..8 \cdot \text{Pi})$



Plotting a grid curve for $u = 3$:
uis3:=
$uis3 := SpaceCurve(r13(3, v), v = 0 ..8 \cdot \text{Pi}, color = red, thickness = 3)$



display(*uis3*, *r13plot*)

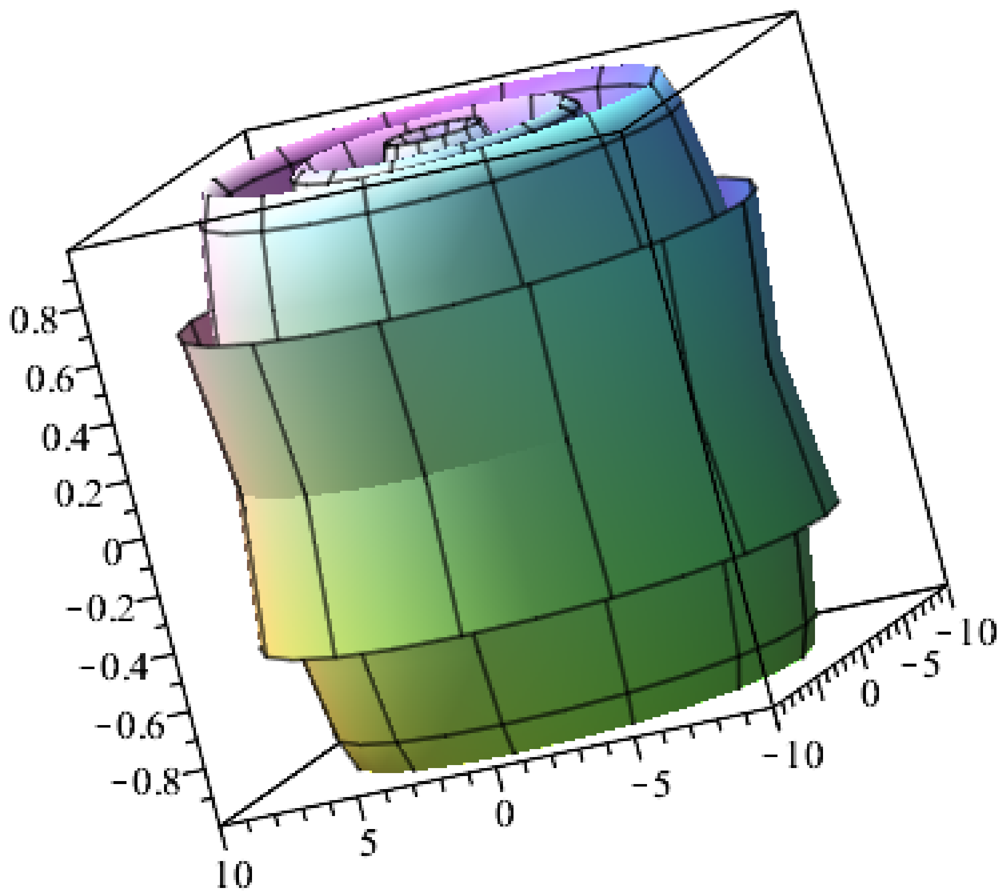


#14

$r14 := (u, v) \rightarrow \langle u \cdot \cos(v), u \cdot \sin(v), \sin(u) \rangle$

$$r14 := (u, v) \mapsto \langle u \cos(v), u \sin(v), \sin(u) \rangle \quad \textbf{(1.2)}$$

$plot3d(r14(u, v), u = -10 \,..10, v = 0 \,..4 \cdot \mathrm{Pi})$

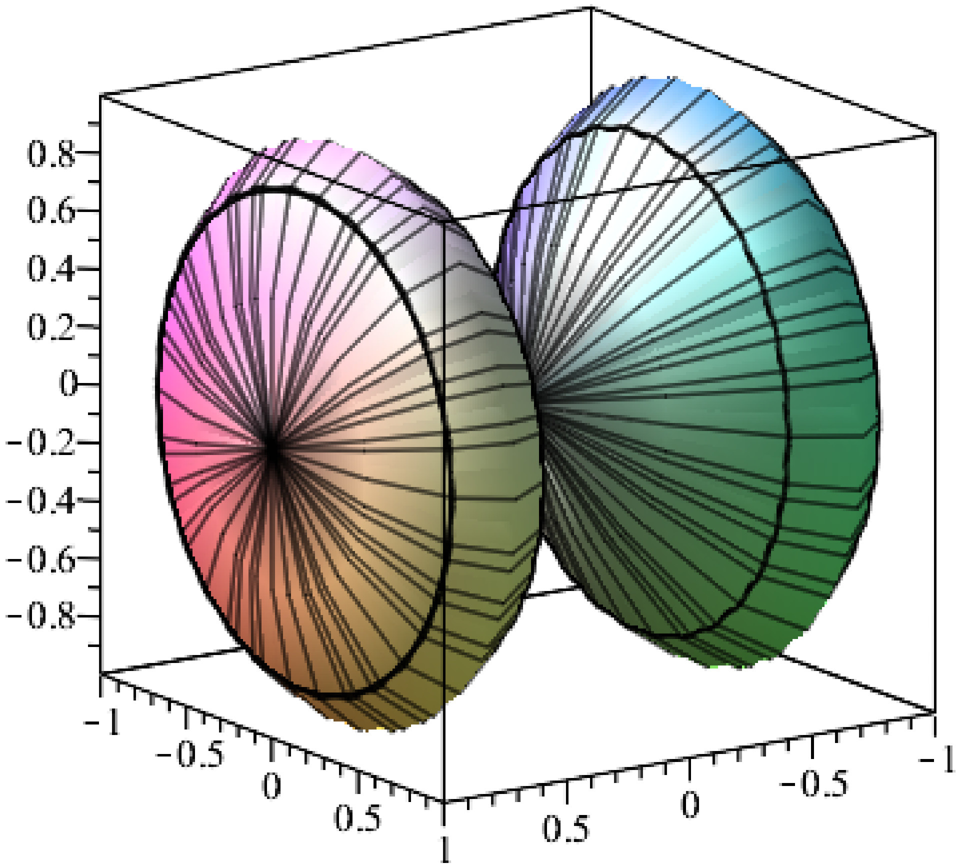


#15

$r15 := (u, v) \rightarrow \langle \sin(v), \cos(u) \cdot \sin(2 \cdot v), \sin(u) \cdot \sin(2 \cdot v) \rangle$

$$r15 := (u, v) \mapsto \langle \sin(v), \cos(u) \sin(2 v), \sin(u) \sin(2 v) \rangle \qquad \textbf{(1.3)}$$

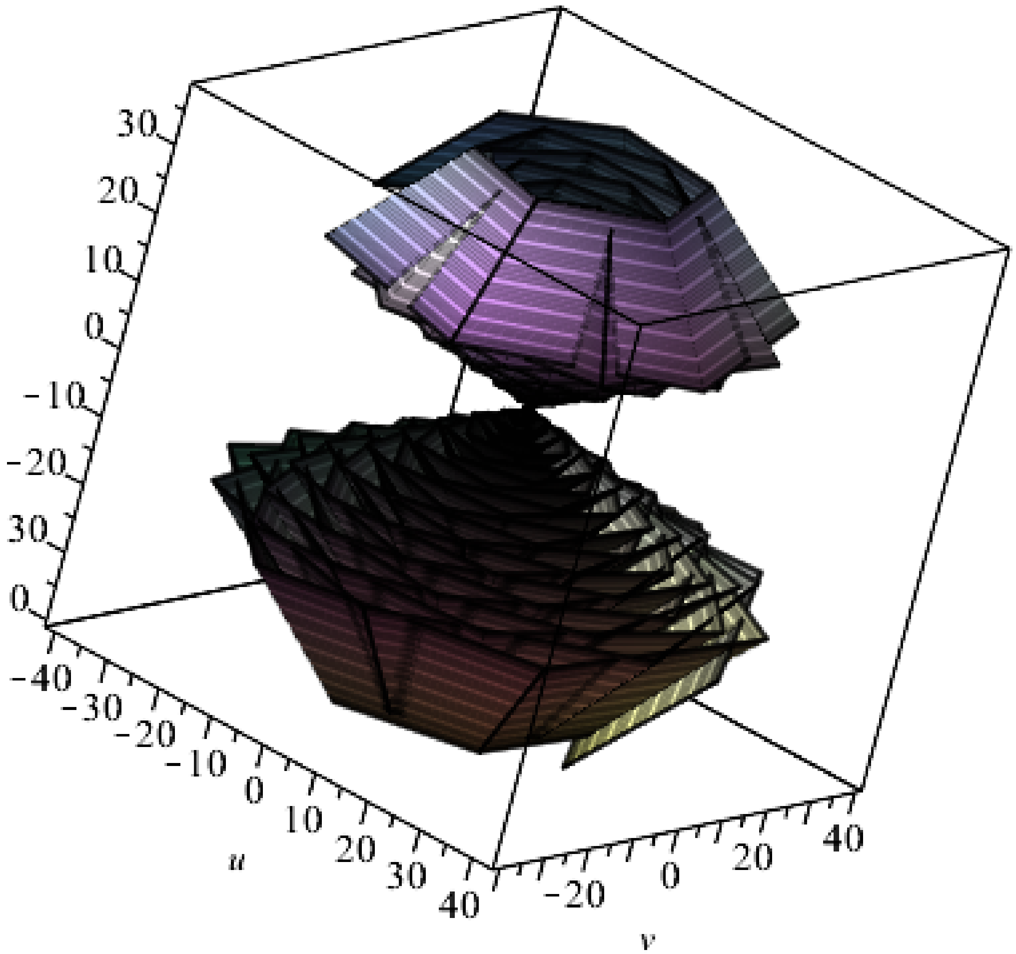
$plot3d(r15(u, v), u = -10..10, v = 0..4 \cdot \mathrm{Pi})$



$r16 := (u, v) \rightarrow \langle (1-u)\cdot(3+\cos(v))\cdot\cos(4\cdot\mathrm{Pi}\cdot u),\ (1-u)\cdot(3+\cos(v))\cdot\sin(4\cdot\mathrm{Pi}\cdot u),\ 3\cdot u + (1-u)\cdot\cos(v)\rangle$

$$r16 := (u, v) \mapsto \langle (1+(-u))\,(3+\cos(v))\,\cos(4\,\pi\,u),\ (1+(-u))\,(3+\cos(v))\,\sin(4\,\pi\,u),\ 3\,u+(1+(-u))\,\cos(v)\rangle \quad \textbf{(1.4)}$$

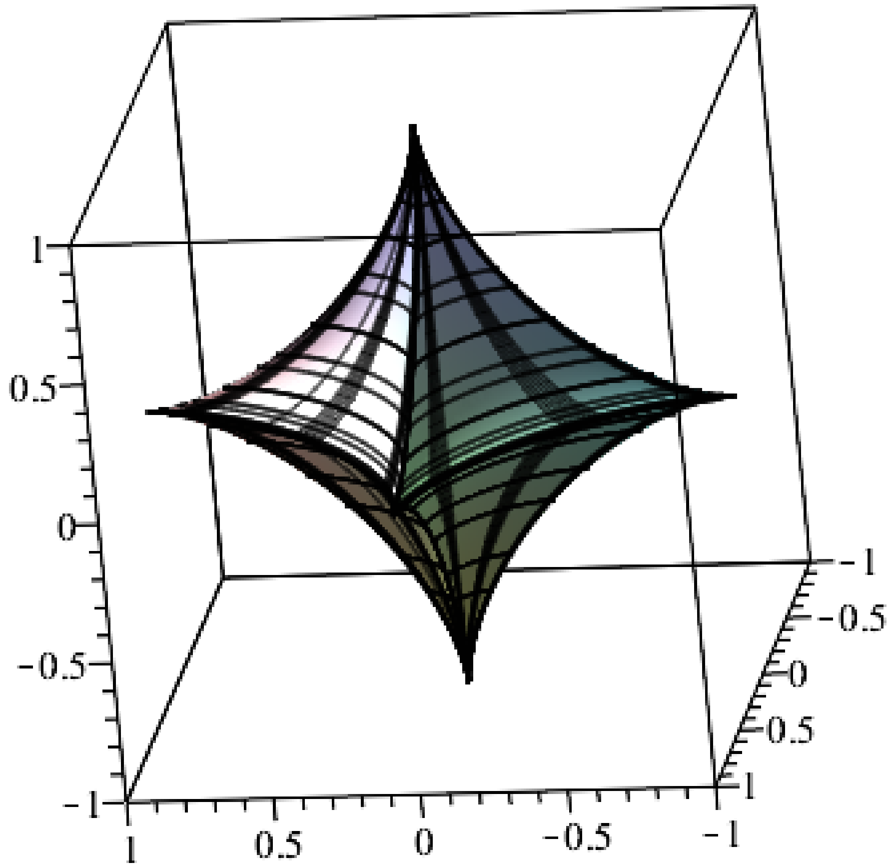
$plot3d(r16(u, v), u = -10..10, v = 0..4\cdot\mathrm{Pi}, numpoints = 50000)$



$r17 := (u, v) \rightarrow \langle \cos(u)^3 \cdot \cos(v)^3, \sin(u)^3 \cdot \cos(v)^3, \sin(v)^3 \rangle$

$$r17 := (u, v) \mapsto \langle \cos(u)^3 \cos(v)^3, \sin(u)^3 \cos(v)^3, \sin(v)^3 \rangle \quad \textbf{(1.5)}$$

$plot3d(r17(u, v), u = -10..10, v = 0..4 \cdot \mathrm{Pi}, numpoints = 50000)$



16.8 #41

16.8 #41 Flux around the sides of the cylinder:

$$\int_0^1 \int_0^{2\cdot \mathrm{Pi}} 2\cdot z\cdot \cos(q) + 8\cdot \sin(q)^2\cdot \cos(q)\ \mathrm{d}q\ \mathrm{d}z$$

$$0 \tag{2.1}$$