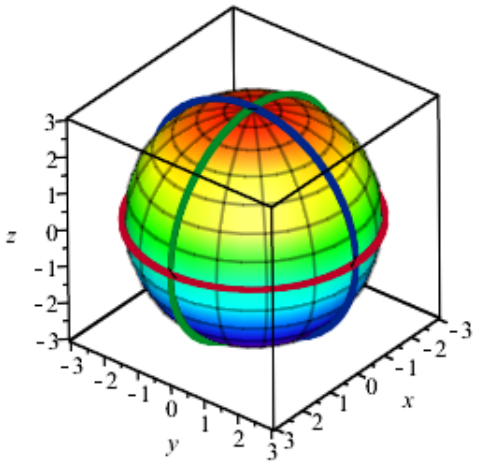
Sphere

$$(x-m)^2+(y-n)^2+(z-p)^2=r^2$$

$$\mathbf{S}=(m,n,p)=(0,0,0)$$

$$r=3$$

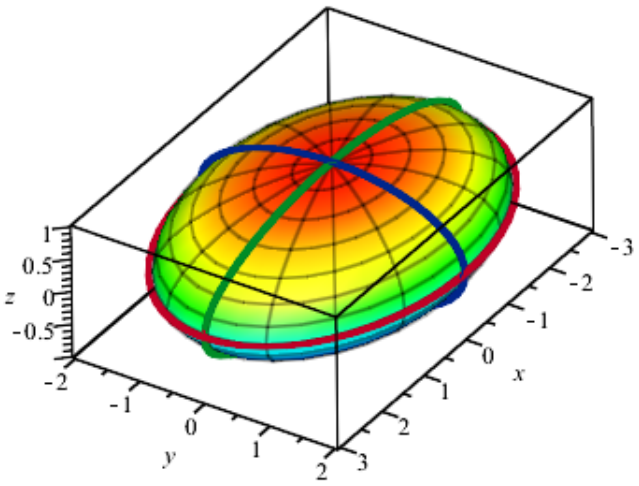


Ellipsoid

$$\frac{(x-m)^2}{a^2}+\frac{(y-n)^2}{b^2}+\frac{(z-p)^2}{c^2}=1$$

$$\mathbf{S}=(m,n,p)=(0,0,0)$$

$$a=3,\ b=2,\ c=1$$



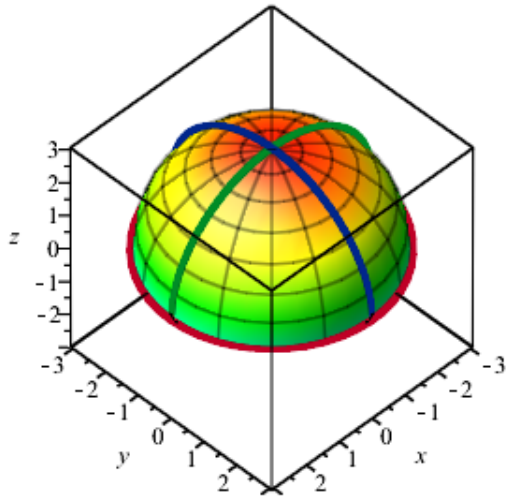
Sphere

(upper part)

$$z=p+c\sqrt{r^2-(x-m)^2-(y-n)^2}$$

$$\mathbf{S}=(m,n,p)=(0,0,0)$$

$$r=3$$



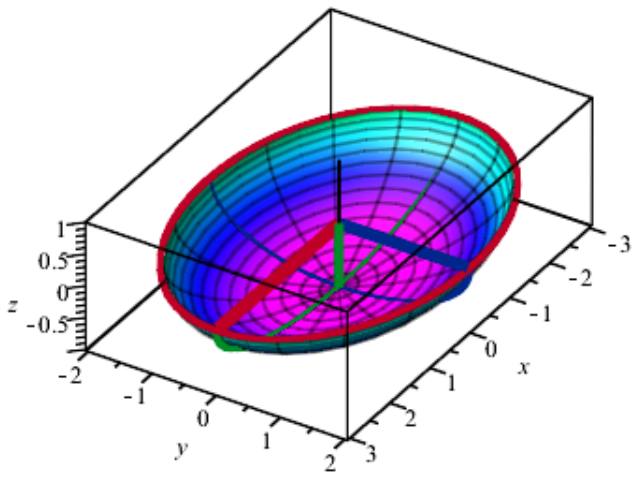
Ellipsoid

(lower part)

$$z=p-c\sqrt{1-\frac{(x-m)^2}{a^2}-\frac{(y-n)^2}{b^2}}$$

$$\mathbf{S}=(m,n,p)=(0,0,0)$$

$$a=3,\ b=2,\ c=1$$

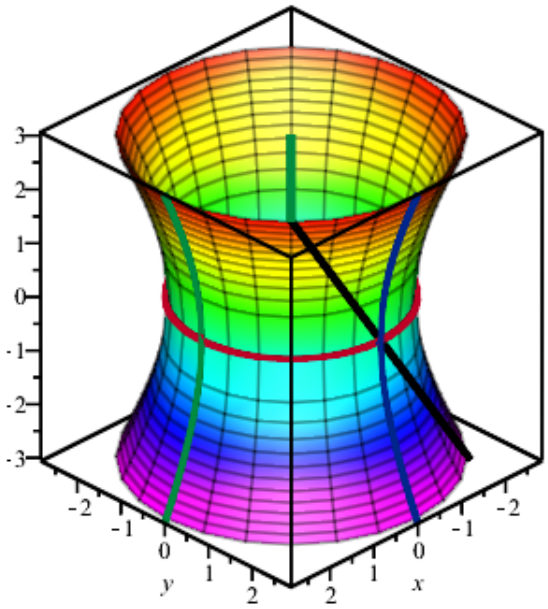


Hyperboloid of revolution of one sheet, $o \parallel z$

$$\frac{(x-m)^2}{a^2}+\frac{(y-n)^2}{b^2}-\frac{(z-p)^2}{c^2}=1$$

$$\mathbf{S}=(m,n,p)=(0,0,0)$$

$$a=b=2,\ c=3$$

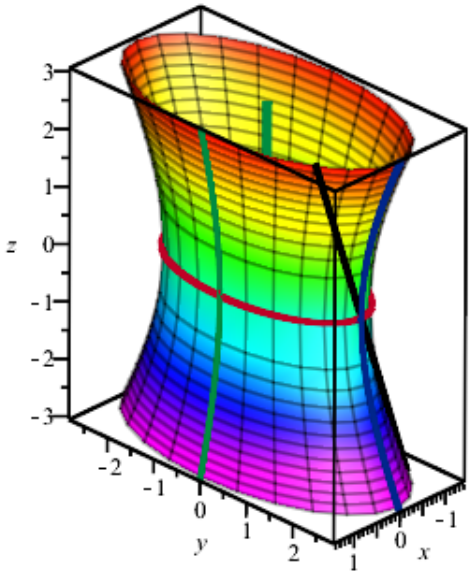


Elliptic hyperboloid of one sheet, $o \parallel z$

$$\frac{(x-m)^2}{a^2}+\frac{(y-n)^2}{b^2}-\frac{(z-p)^2}{c^2}=1$$

$$\mathbf{S}=(m,n,p)=(0,0,0)$$

$$a=1,\ b=2,\ c=3$$

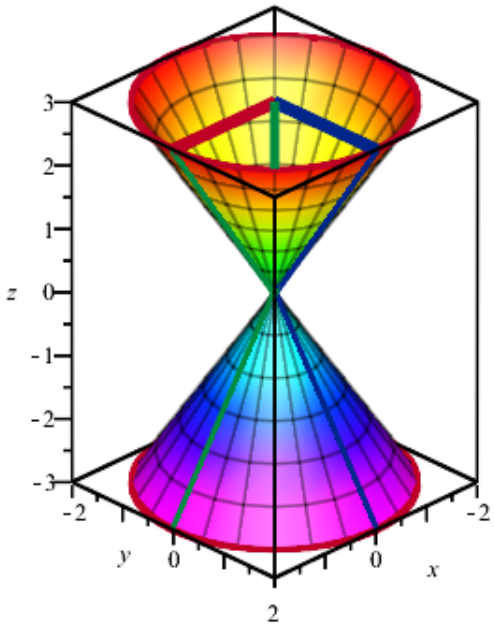


Cone of revolution, $o \parallel z$

$$\frac{(x-m)^2}{a^2}+\frac{(y-n)^2}{b^2}-\frac{(z-p)^2}{c^2}=0$$

$$\mathbf{V}=(m,n,p)=(0,0,0)$$

$$a=b=2,\ c=3$$

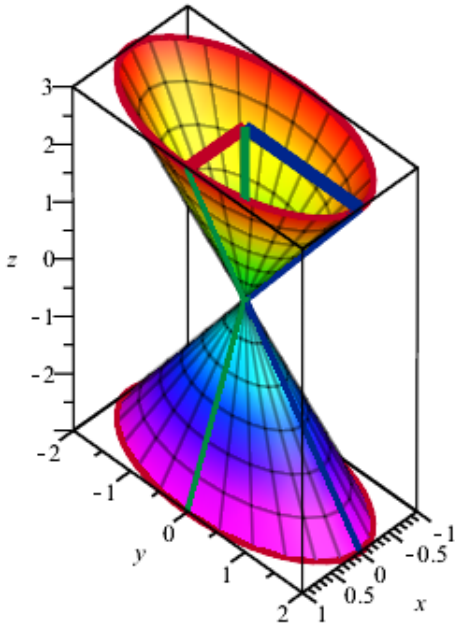


Eliptic cone, $o \parallel z$

$$\frac{(x-m)^2}{a^2}+\frac{(y-n)^2}{b^2}-\frac{(z-p)^2}{c^2}=0$$

$$\mathbf{V}=(m,n,p)=(0,0,0)$$

$$a=1,\ b=2,\ c=3$$

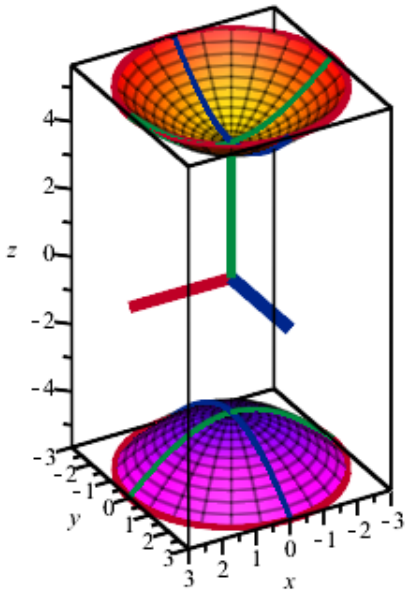


Hyperboloid of revolution of two sheets, $o \parallel z$

$$-\frac{(x-m)^2}{a^2}-\frac{(y-n)^2}{b^2}+\frac{(z-p)^2}{c^2}=1$$

$$\mathbf{S}=(m,n,p)=(0,0,0)$$

$$a=b=3,\ c=4$$

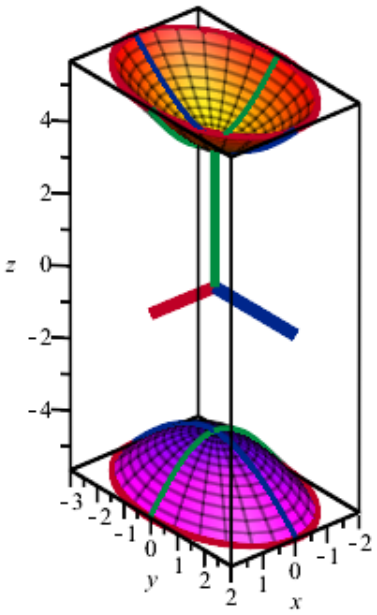


Elliptic hyperboloid of two sheets, $o \parallel z$

$$-\frac{(x-m)^2}{a^2}-\frac{(y-n)^2}{b^2}+\frac{(z-p)^2}{c^2}=1$$

$$\mathbf{S}=(m,n,p)=(0,0,0)$$

$$a=2,\ b=3,\ c=4$$

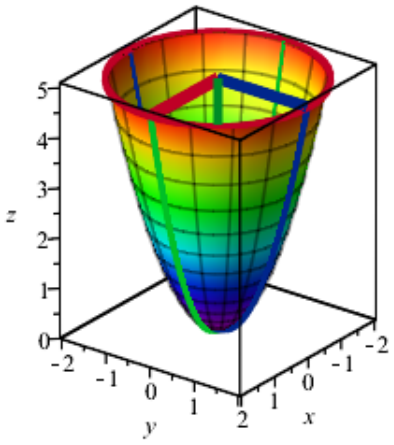


Paraboloid of revolution, $o \parallel +z$

$$\frac{(x-m)^2}{a^2}+\frac{(y-n)^2}{b^2}=\frac{z-p}{c}$$

$$\mathbf{V}=(m,n,p)=(0,0,0)$$

$$a=b=2,\ c=5$$

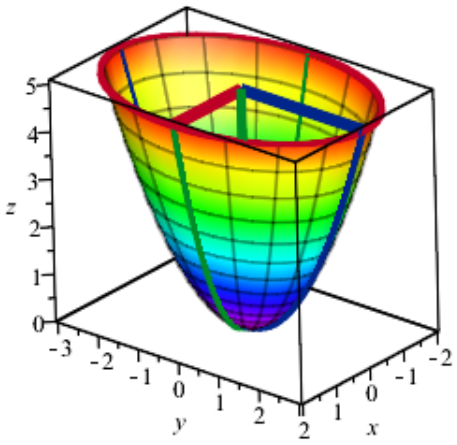


Elliptic paraboloid, $o \parallel +z$

$$\frac{(x-m)^2}{a^2}+\frac{(y-n)^2}{b^2}=\frac{z-p}{c}$$

$$\mathbf{V}=(m,n,p)=(0,0,0)$$

$$a=2,\ b=3,\ c=5$$

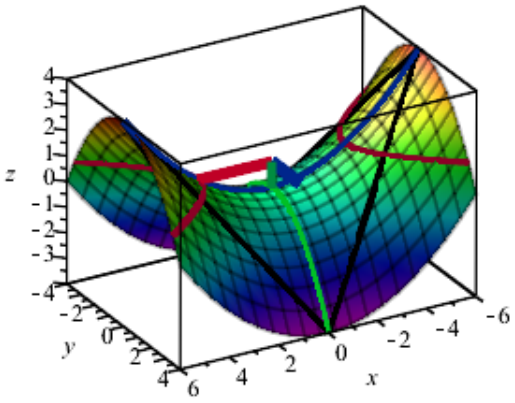


Hyperbolic paraboloid, $o \parallel +z$

$$\frac{(x-m)^2}{a^2} - \frac{(y-n)^2}{b^2} = \frac{z-p}{c}$$

$\mathbf{V} = (m, n, p) = (0, 0, 0)$

$a = 3,\ b = 2,\ c = 1$

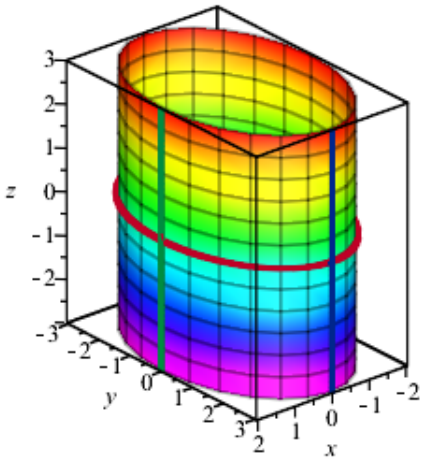


Elliptic cylinder, $o \parallel z$

$$\frac{(x-m)^2}{a^2} + \frac{(y-n)^2}{b^2} = 1$$

$\mathbf{S} = (m, n, z) = (0, 0, z)$

$a = 2,\ b = 3$

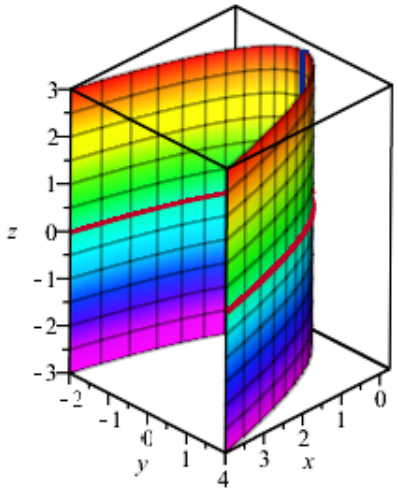


Parabolic cylinder, $o \parallel z$

$$\frac{(x-m)^2}{a^2} = 2p(z-p)$$

$\mathbf{V} = (m, n, p) = (0, 0, 0)$

$p = \frac{1}{2}$



Hyperbolic cylinder, $o \parallel z$

$$\frac{(x-m)^2}{a^2} - \frac{(y-n)^2}{b^2} = 1$$

$\mathbf{S} = (m, n, p) = (0, 0, 0)$

$a = 2,\ b = 3$