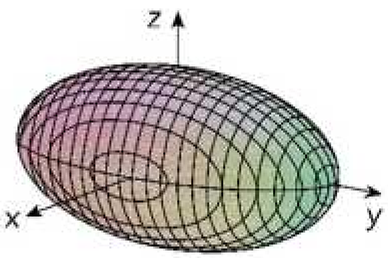
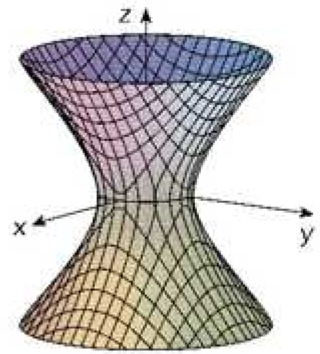
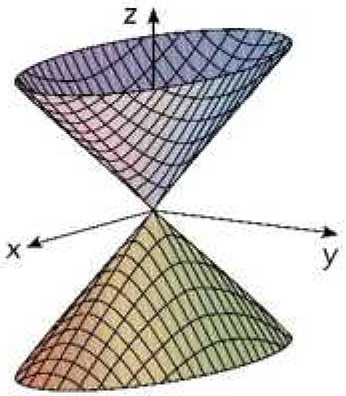
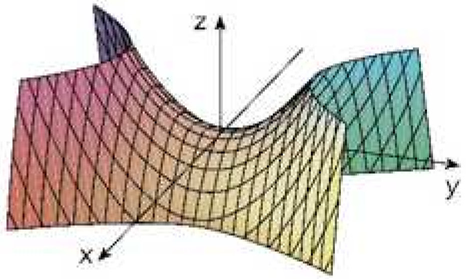
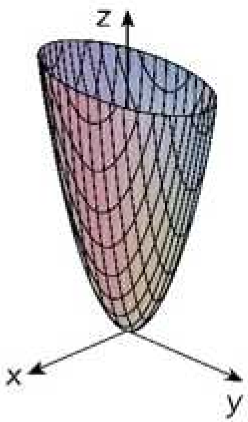
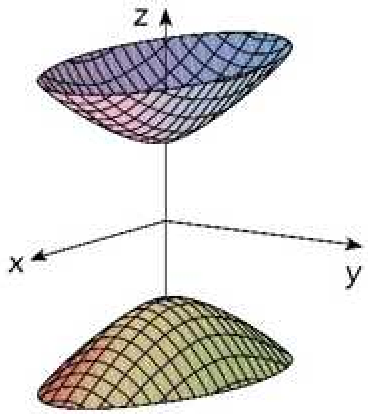
Ellipsoid  	$$\frac{x^2}{a^2}+\frac{y^2}{b^2}+\frac{z^2}{c^2}=1$$ "A bunch of ellipses stacked together" Special case: If $a=b=c$, we have a sphere	Hyperboloid of One Sheet  	$$\frac{x^2}{a^2}+\frac{y^2}{b^2}-\frac{z^2}{c^2}=1$$ In the xy plane, the traces are ellipses. In the xz or yz planes, the traces are hyperbolas. *Whichever variable is negative corresponds to the axis of symmetry
Cone  	$$\frac{z^2}{c^2}=\frac{x^2}{a^2}+\frac{y^2}{b^2}$$ In the xy plane, the traces are ellipses. In the xz or yz planes, the traces are hyperbolas, except when $x=0$ or $y=0$, then the traces are pairs of lines	Hyperbolic Paraboloid  	$$\frac{z}{c}=\frac{x^2}{a^2}-\frac{y^2}{b^2}$$ In the xy plane, the traces are hyperbolas. In the xz or yz plane, the traces are parabolas.
Elliptic Paraboloid  	$$\frac{z}{c}=\frac{x^2}{a^2}+\frac{y^2}{b^2}$$ In the xy plane, the traces are ellipses. In the xz or yz planes, the traces are parabolas.	Hyperboloid of Two Sheets  	$$-\frac{x^2}{a^2}-\frac{y^2}{b^2}+\frac{z^2}{c^2}=1$$ In the xy plane, the traces are ellipses if $z>c$ or $z<-c$ In the xz or yz planes, the traces are hyperbolas.