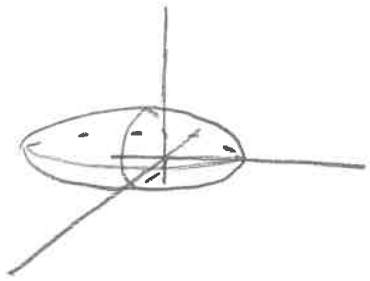
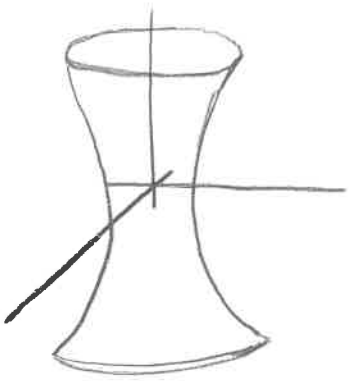
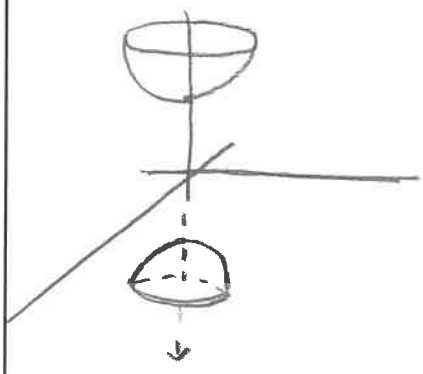
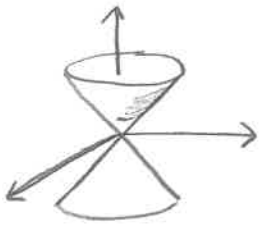
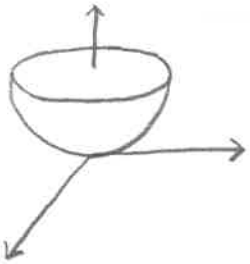
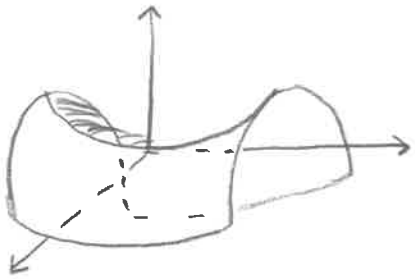
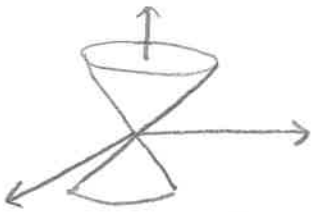
Name	Formula	Graph	Things to Notice
Ellipsoid	$\frac{x^2}{a^2}+\frac{y^2}{b^2}+\frac{z^2}{c^2}=1$		
Hyperboloid (One Sheet)	$\frac{x^2}{a^2}+\frac{y^2}{b^2}-\frac{z^2}{c^2}=1$		axis corresponds to variable w/ negative coefficient
Hyperboloid (Two Sheets)	$-\frac{x^2}{a^2}-\frac{y^2}{b^2}+\frac{z^2}{c^2}=1$		axis corresponds to variable w/ positive coefficient
Cones	$\frac{x^2}{a^2}+\frac{y^2}{b^2}-\frac{z^2}{c^2}=0$		axis corresponds to variable w/ negative coefficient circular if coefficients are equal (a & b)

$$\frac{x^2}{a^2}+\frac{y^2}{b^2}=\frac{z^2}{c^2}$$

Paraboloids	$\frac{x^2}{a^2} + \frac{y^2}{b^2} = \frac{z}{c}$ $\frac{x^2}{a^2} + \frac{y^2}{b^2} - \frac{z}{c} = 0$		axis corresponds to linear variable circular if coefficients of quadratic terms are equal
Hyperbolic Paraboloids	$\frac{x^2}{a^2} - \frac{y^2}{b^2} = z$		negative quadratic term ↺ positive quadratic term ↻ extends forever in linear term axis

Cones



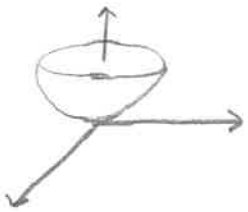
$$\frac{x^2}{a^2} + \frac{y^2}{b^2} - \frac{z^2}{c^2} = 0$$

axis corresponds to variable w/ negative coefficient

circular if coefficients of positive variables the same

Paraboloids

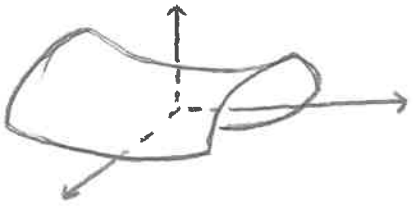
$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = z$$



axis corresponds to linear variable

circular if coefficients of quadratic terms are the same

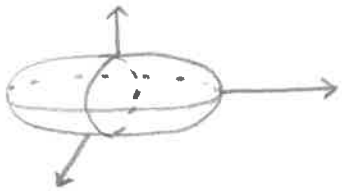
Hyperbolic Paraboloid



$$\frac{x^2}{a^2} - \frac{y^2}{b^2} = z$$

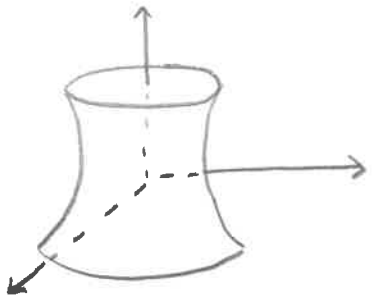
axis corresponds to linear variable

Ellipsoid



$$\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1$$

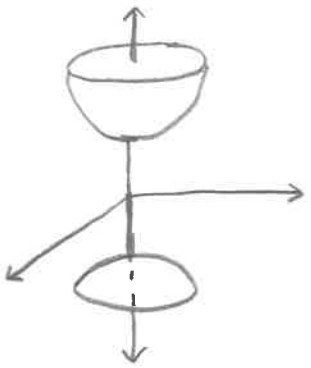
Hyperboloid (one sheet)



$$\frac{x^2}{a^2} + \frac{y^2}{b^2} - \frac{z^2}{c^2} = 1$$

axis corresponds to variable w/ negative coefficient

Hyperboloid (two sheet)



$$-\frac{x^2}{a^2} - \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1$$

axis corresponds to variable w/ positive coefficient