

Graphing Paraboloids

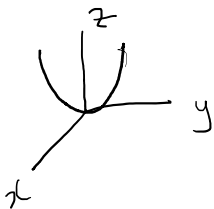
Trace : Surface \cap Plane

esp. when plane is $x=0$, $y=0$, or $z=0$

Ex: Graph $z = x^2 + y^2$ using traces

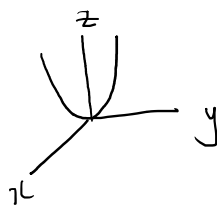
$x=0$:

$z = y^2$



$y=0$:

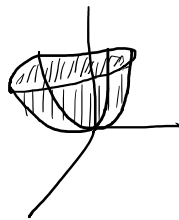
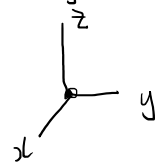
$z = x^2$



$z=0$:

$0 = x^2 + y^2$

$(x, y) = (0, 0)$



paraboloid

Contour Curve : Surface \cap ($z=c$)

Ex: Graph $z = x^2 + y^2$ using contour curves

$z=0$: $0 = x^2 + y^2$

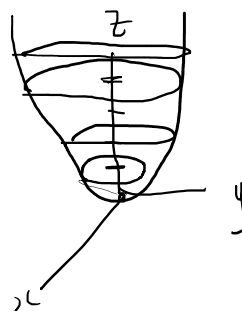
circle of radius 0 (origin)

$z=1$: $1 = x^2 + y^2$

" 1

$z=4$: $4 = x^2 + y^2$

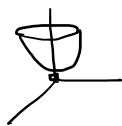
" 2



paraboloid

2c

$$z = x^2 + y^2$$



$$z = \frac{1}{2}(x^2 + y^2)$$



$$z = -(x^2 + y^2)$$



$$z = x^2 + y^2 + 1$$



$$x = y^2 + z^2$$

