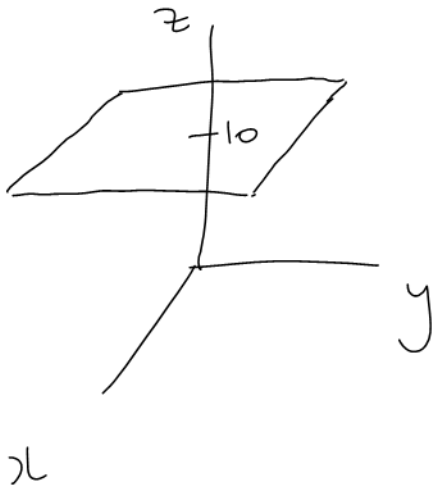


(21)

$$f(x,y) = 10 \quad \text{or} \quad z = 10$$

PLANE

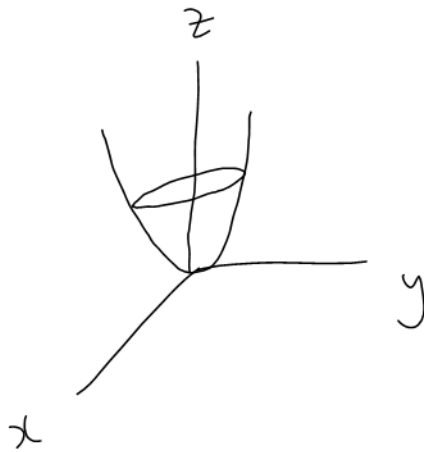


(25)

$$f(x, y) = x^2 + y^2 \quad \text{or} \quad z = x^2 + y^2$$

PARABOLOID

Could use traces or contour curves.
This is one of the five important surfaces.



(27) $f(x,y) = \sqrt{4-x^2-y^2}$
 or $z = \sqrt{4-x^2-y^2}$

Contour curves : $z < 0$: no solution

$z = 0$: $0 = \sqrt{4-x^2-y^2}$

$0 = 4-x^2-y^2$

$x^2+y^2 = 4$

$z = 1$: $1 = \sqrt{4-x^2-y^2}$

$1 = 4-x^2-y^2$

$x^2+y^2 = 3$

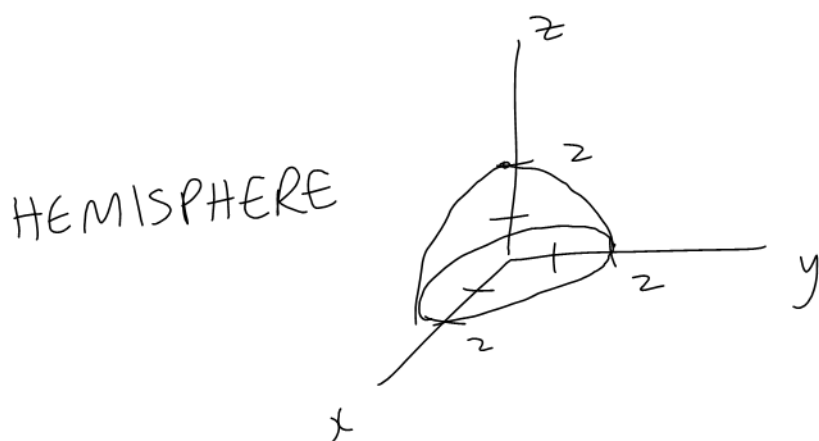
$z = 2$:

$2 = \sqrt{4-x^2-y^2}$

$4 = 4-x^2-y^2$

$x^2+y^2 = 0$

$z > 2$: no solution



Aside:

$z = -\sqrt{4-x^2-y^2}$



$z = \pm \sqrt{4-x^2-y^2}$



(29) $f(x,y) = 10 - \sqrt{x^2 + y^2}$

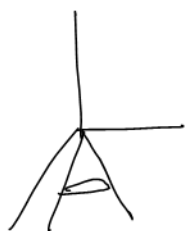
or $z = 10 - \sqrt{x^2 + y^2}$ CONE WITH ONE NAPPE

Could use contour curves or traces.

Transformations are probably easiest.



$$z = \sqrt{x^2 + y^2}$$



$$z = -\sqrt{x^2 + y^2}$$

z



$$z = 10 - \sqrt{x^2 + y^2}$$

x