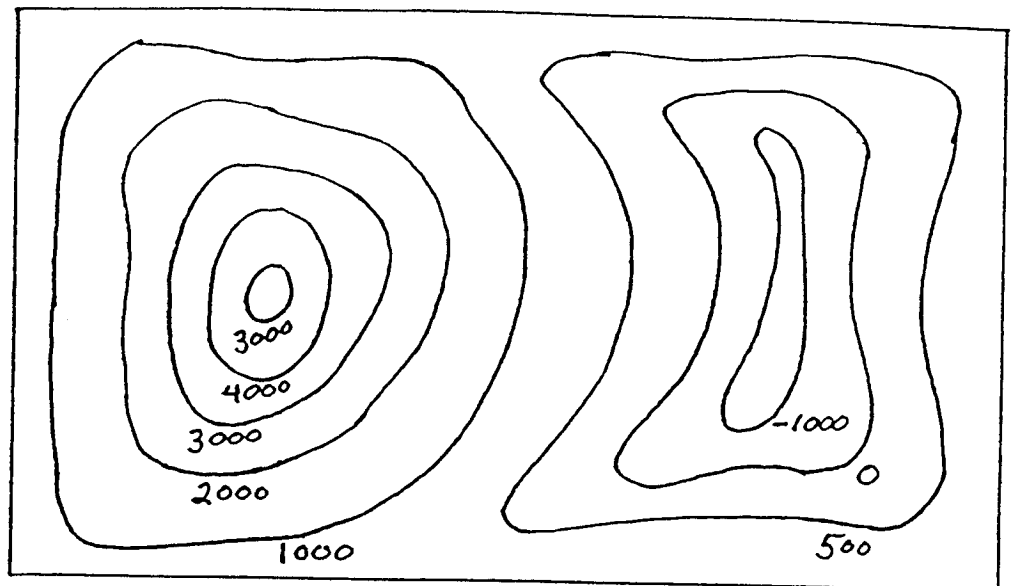# SKETCHING SURFACES IN THREE-SPACE USING LEVEL CURVES

<u>RECALL</u> : Topographical Map

Assume that the numbers represent height in feet relative to sea level of a particular region.



<u>DEFINITION</u> : The intersection of a horizontal plane at a particular height $z = c$ with a given surface is called a <u>level curve</u>.

<u>EXAMPLE</u> : Sketch the surface $z = x^2 + y$ using level curves.

| Values for z | Level curves | |
| --- | --- | --- |
| -3 | $-3 = x^2 + y$ | $y = -x^2 - 3$ |
| -2 | $-2 = x^2 + y$ | $y = -x^2 - 2$ |
| -1 | $-1 = x^2 + y$ | $y = -x^2 - 1$ |
| 0 | $0 = x^2 + y$ | $y = -x^2$ |
| 1 | $1 = x^2 + y$ | $y = -x^2 + 1$ |
| 2 | $2 = x^2 + y$ | $y = -x^2 + 2$ |
| 3 | $3 = x^2 + y$ | $y = -x^2 + 3$ |