Math 2415
Homework on 14.1

1. Stewart 14.1.44

2. Sketch the level curves $f(x, y) = c$ of the following functions $z = f(x, y)$ at the specified values of c. Then sketch the graph of f.

   (a) $f(x, y) = (100 - x^2 - y^2)^{1/2}$, $c = 0,\ 2,\ 4,\ 6,\ 8$

   (b) $f(x, y) = y - x^2$, $c = 0,\ \pm 1,\ \pm 2$.

3. Sketch the level surfaces $f(x, y, z) = c$ of the following functions $w = f(x, y, z)$ at the specified values of c.

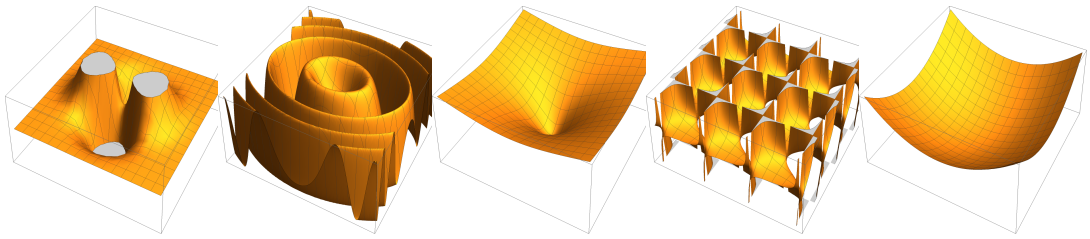
   (a) $f(x, y, z) = 4x^2 + y^2 + 9z^2$, $c = 0,\ 1,\ 2$.

4. Match the functions $z = f(x, y)$ with the surfaces representing their graphs. Justify your answers. (The origin is in the middle of each box. The figures only show that portion of the surface that is inside a box.)

   (a) $f(x, y) = x^2 + y^2$

   (b) $f(x, y) = (x^2 - y^2)\exp(-x^2 - y^2)$

   (c) $f(x, y) = \sin(x^2 + 2y^2)$



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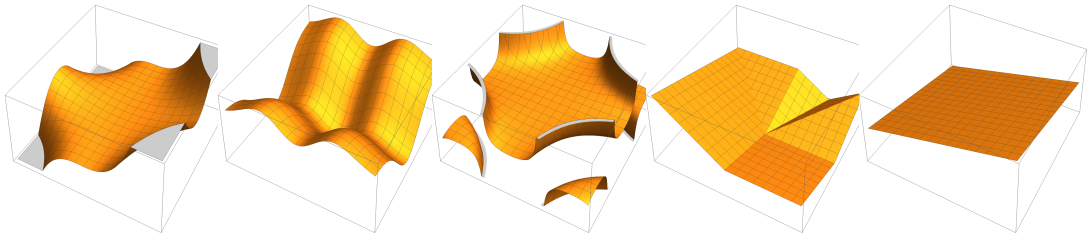

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