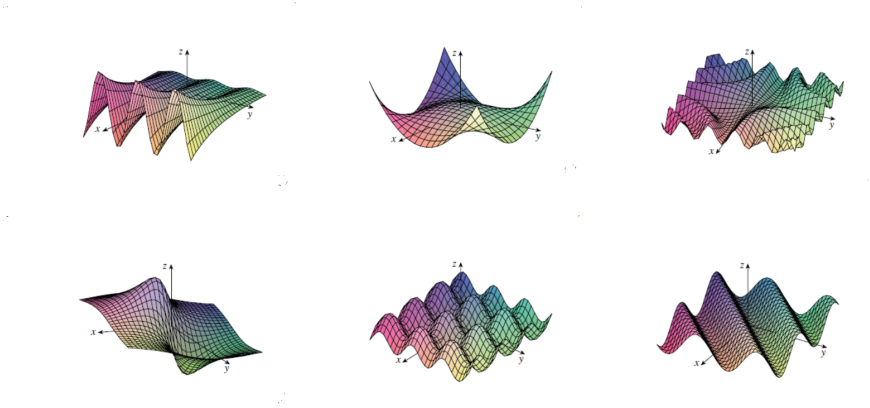
Math 2211: Recitation 6 (T)

Naufil Sakran

(1) Solve any **three** of the following problems:

(a) Circle the plot representing the function $z = e^x \cos(y)$.



(b) Find the domain and range of the following function

$$f(x, y, z) = \ln(z - \sqrt{x^2 + y^2}).$$

(c) Draw the contour map of $f(x, y) = x^2 + y^2$.

(2) Solve the following problems. **(Do any two of them)**.

(a) Find the limit

$$\lim_{(x,y)\to(0,0)} \frac{xy^2 \cos(y)}{8x^2 + y^4}.$$

(b) If $f(x,y) = \sqrt{4 - x^2 - 10y^2}$, find $f_x(0,1)$ and $f_y(1,0)$.

(c) Consider the surface $z = 4x^2 + y^2 - 5y$. Find the equation of the tangent plane to the given surface at the point $(1, 2, -2)$.

(Bonus) Solve the following integrals. **(Do any one of them)**.

(a) Use chain rule to find $\frac{dz}{dt}$ where

$$z = \sin(x)\cos(x), \quad x = \sqrt{t}, \quad y = \frac{7}{t}.$$

(b) Use polar coordinates to find the limit.

$$\lim_{(x,y)\to(0,0)} \frac{x^4 + y^5}{x^2 + y^2}.$$