> restart;

> $with(plots):$

> $f := \ln(x^2 + y^3);$

$$f := \ln(y^3 + x^2) \qquad (1)$$

> $r := 2;$

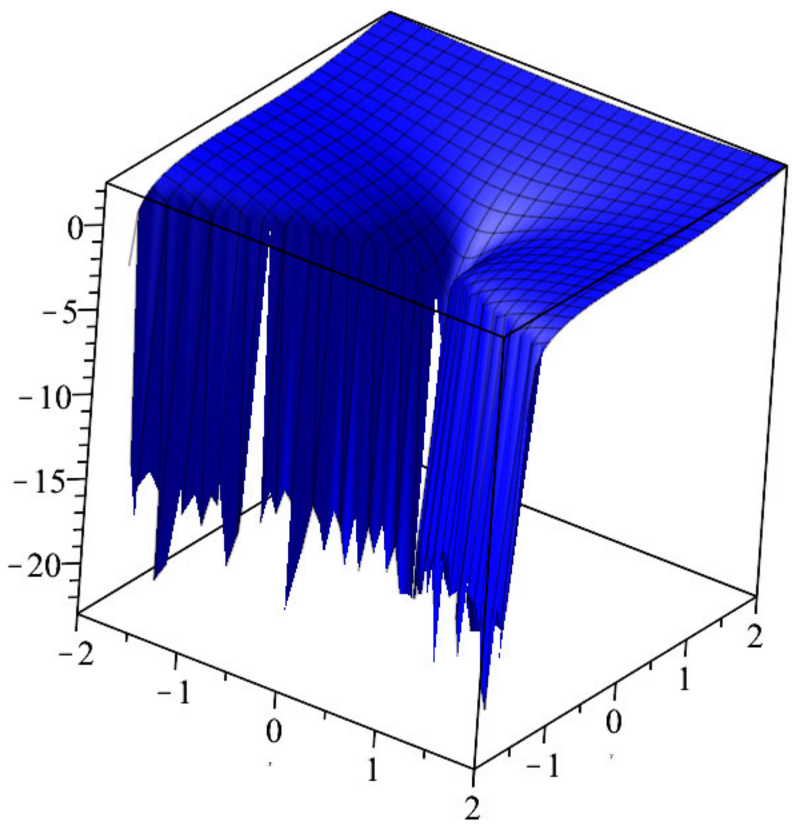
$$r := 2 \qquad (2)$$

> #Here is the Taylor polynomial centered at (x,y) = (1,2). Computed by hand or with the maple command

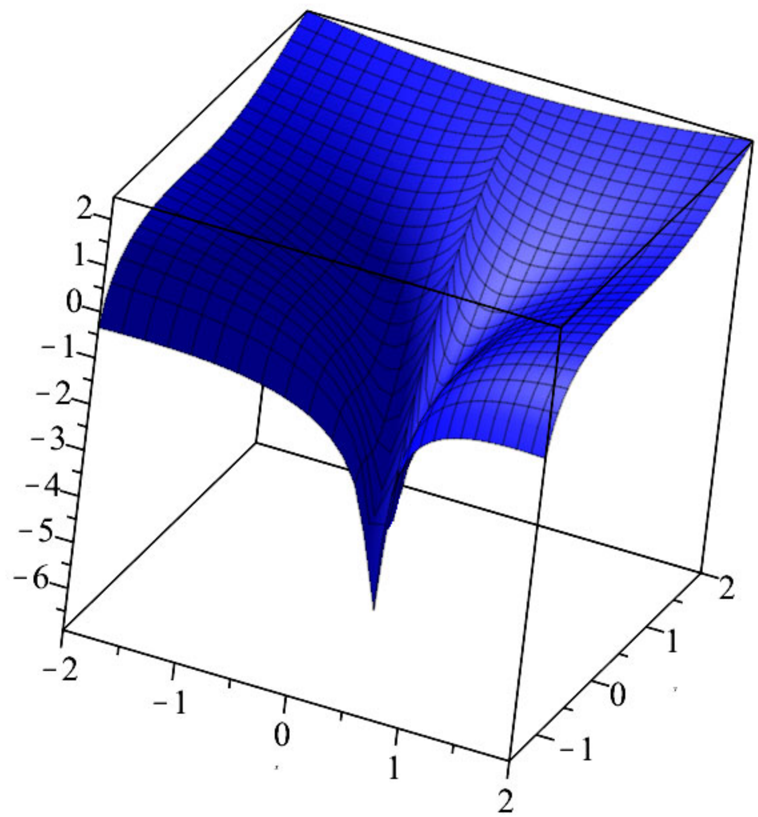
> $T2f := mtaylor(f, [x = 1, y = 0], 3);$

$$T2f := -(x-1)^2 + 2x - 2 \qquad (3)$$

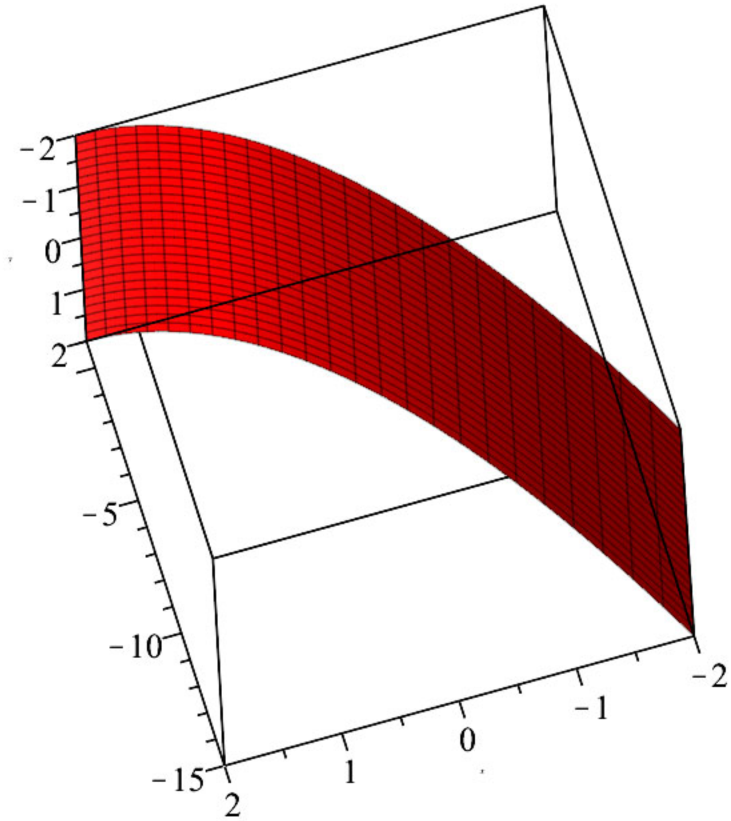
> $plot3d(f, x = -r..r, y = -r..r, color = blue);$ *#as this has an asyptotle along the line* $-x^2 = y^3$ *the plot has trouble*



> fplot:= plot3d(f, x = -r .. r, y = -(x^(2))^(1/3)+0.1 .. r, color = blue); #plotting over a domain starting just away from the curce y^3 = -x^2

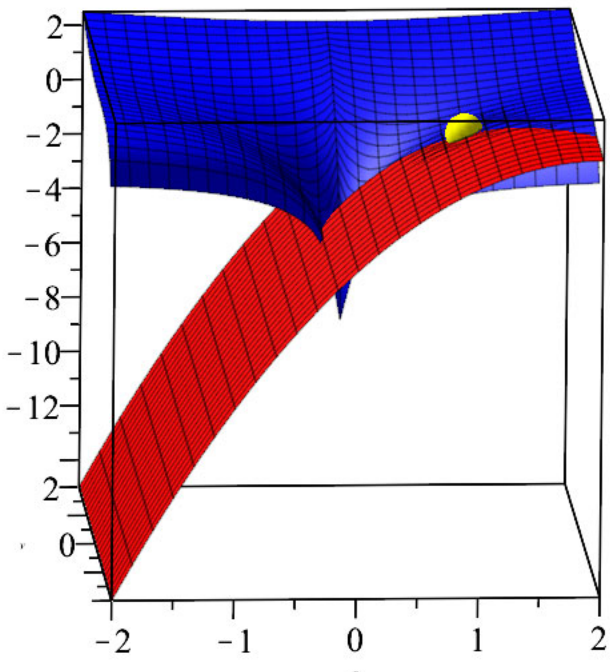


> $Tplot := plot3d(T2f, x=-r..r, y=-r..r, color=red);$



> $P := pointplot3d([1, 0, 0], symbol = solidcircle, symbolsize = 40, color = yellow)$:

> $display([fplot, Tplot, P])$;



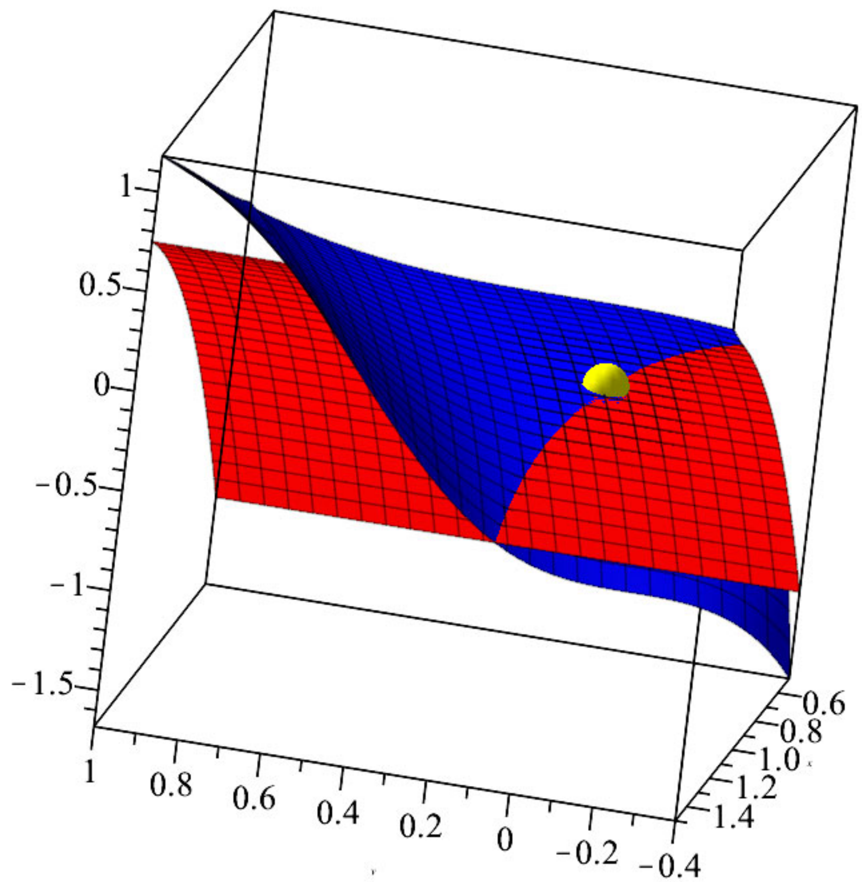
> #Zoomning in at point of approximation.

>

> $fplot2 := plot3d(f, x = 0.5 ..1.5, y = -0.4 ..1, color = blue)$:

> $Tplot2 := plot3d(T2f, x = 0.5 ..1.5, y = -0.4 ..1, color = red)$:

> $display([fplot2, Tplot2, P])$;


1
0.5
0
−0.5
−1
−1.5
1
0.8
0.6
0.4
0.2
0
−0.2
−0.4
0.6
0.8
1.0
1.2
1.4