PHYS2063 Wave Physics Homework #12 Due Thursday 6 Oct 2022

This homework assignment is due at the start of class on the date shown. You may submit a PDF of your solutions to the Canvas page for the course, or bring a paper copy to class.

Use MATHEMATICA to combine a "contour" plot of the scalar field

$$f(x, y, z) = 100\, e^{-(x^2+y^2)}$$

and a "vector" plot of $\vec{\nabla} f$. Make the x and y axis ranges large enough to show several contours. This will let you observe how the gradient is larger where the contours are closer together.

The functions you'll probably want to use are ContourPlot and VectorPlot. I think that the option ContourShading $\rightarrow$ None is best. You might try using Contours $\rightarrow$ N to get N contours. Use the option PlotLegends $\rightarrow$ Automatic to include the meaning of the colors in the vector plot.