Basic Plotting:

Make sure that each plot has a title that properly identifies it. Plot all functions over the domain $x = -2..2$

- Plot: $f_1(x) = e^{-0.3x^2} \sin(x)$
- Plot: $f_2(x) = \cos(x) \sin(x)$
- Plot: $f_3(x) = \sin(x) + \cos(x)$
- Plot: $f_4(x) = \sin(x) + \sin(2x)$
- On the same plot, graph $f_1, f_2, f_3, f_4$ simultaneously.
- Find by inspection the intercept of $f_1(x)$ with the x-axis over the interval $x = [2..4]$.

Lists and Sequences

- Create a function $g(x) = e^{-x^2}$
- List the values of $g(x)$ at the integer values $x = [-5, -4, ..., 4, 5]$.
- Print the sum of these numbers, and its decimal equivalent.
- Print the product of these numbers, and its decimal equivalent.
- Evaluate: $\sum_{n=1}^{\infty} \frac{1}{n^2}$
- Evaluate this sum to 50 decimal places.

3D Plots

Make sure that each plot has a title that properly identifies it. Plot all functions over the domain $x = [-2..2]$ and $y = [-2..2]$ in a boxed plot.

- Define the function $r_1(x, y) = \sqrt{x^2 + y^2}$
- Define the function $r_2(x, y) = \sqrt{x^2 + y^2} + \sin(x) \cos(2y)$
- Define the function $g(m) = e^{-m^2}$
- Plot $g(r_1(x, y))$
- Plot $g(r_2(x, y))$

Problem Solving

- Which of these is greater: $a = \left(\frac{3}{4}\right)^{42}$ or $b = \left(\frac{7}{8}\right)^{91}$? Make sure your answer is well justified.