10.4 - Sin Cos

Write a Python program that uses `matplotlib` to draw a plot of the following sine and cosine functions from 0 to 2π on the same axes.

$$f_1 = \sin(x^2)$$
$$f_2 = \cos(x)^2$$

Include x-axis tick marks every $\frac{\pi}{2}$ and y-axis tick marks at -1 and 1. Color f_1 red, and f_2 blue.

Save the resulting figure as `sin_cos_login.pdf` and save your completed Python program as `sin_cos_login.py`, where `login` is your Purdue login. Then submit both of them. You do not need to submit a screenshot for this exercise.

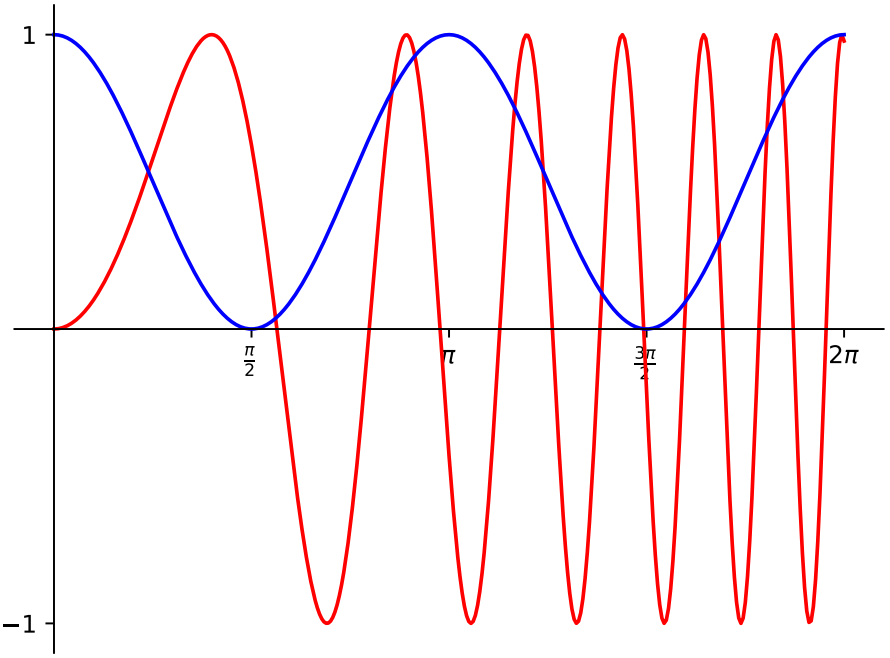

Figure 1: A sample plot of sin and cosine for Exercise 10.4.

Hints:

- Use LaTeX notation to write your x-axis tick labels. For example, to write $\frac{\pi}{2}$ in Python, you would use the string `r"$\frac{\pi}{2}$"`. Here the letter `r` indicates that this is a raw string and prevents Python from interpreting the backslashes as escape characters. The dollar signs indicate to `matplotlib` that this string used LaTeX notation. `\frac{}{}` is the LaTeX command to create a fraction. The numerator and denominator go into the first and second pair of braces respectively. The symbol for π is just `\pi`.