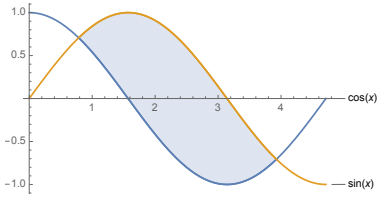
We cannot find an antiderivative for $\sin(x^2)$, but there are a couple of ways we can approach finding an approximation for

$$\mathcal{I} = \int_0^1 \sin(x^2)\, dx$$

1. Plot $y = \sin(x^2)$,
   (a) Calculate L_{10} and R_{10}.
   (b) Will L_{10} overestimate or underestimate $\mathcal{I}$? How about R_{10}?
   (c) How accurate is your approximation to the exact value of $\mathcal{I}$?

2. Find the Taylor Polynomial of degree 7 for $\sin(x)$ (Check your notes from March 29)
   (a) Use this to find a Taylor polynomial for $\sin(x^2)$.
   (b) Substitute this Taylor polynomial into the integral and evaluate to approximate $\mathcal{I}$.

1. Find the area of the region shaded in blue, bounded by the graphs of $y = \sin(x)$ and $y = \cos(x)$



2. Find the area of the region bounded by the graphs of $y = x^3$ and $y = x^2 + x$