Honors HW3 (due 13 February)
We looked at **volumes** of solids of revolution in class. In this assignment, we will look at **surface area** of solids of revolution.

From the text, Section 2.4, p. 279, the surface area of a solid of revolution formed by rotating the curve $f(x)$ above $[a, b]$ around the $x$-axis is given by

$$\text{SurfaceArea} = 2\pi \int_a^b f(x)\sqrt{1 + (f'(x))^2}\mathrm{d}x.$$

1.) Find the surface area of the solid of revolution obtained by rotating the curve $f(x) = x^3$ lying above $[0, 1]$ around the $x$-axis.

2.) Find the surface area of the solid of revolution obtained by rotating the curve $f(x) = \sqrt{9 - x^2}$ lying above the interval $[-2, 2]$ around the $x$-axis.

3.) Set up **but do not evaluate** an integral to compute the surface area of the solid of revolution obtained by rotating the curve $f(x) = \sin(2x)$ lying above $\left[0, \frac{\pi}{8}\right]$ about the $x$-axis.

4.) Use software (my suggestion: WolframAlpha) to numerically solve the integral that you found in Problem 3.