Problem statement Suppose $f(x) = 2x^2 - x^3$ and $g(x) = \sin(\frac{x}{2})$.

a) Use your calculator to sketch the two functions $y = f(x)$ and $y = g(x)$ on the interval $[0, 2]$. Note all the points of intersection as precisely as you can.

b) What is the exact value of $\int_0^2 f(x) - g(x) \, dx$? Find a numerical approximation of this value. What does the value of this integral tell you about the areas of the regions between the two graphs?