(1) Find the average value of $f(x) = \cos^6(x) \sin(x)$ on $[0, \pi]$.

(2) Evaluate $\int_0^s e^t \sin(s - t) \, dt$.

(3) Find the volume of the solid obtained by rotating the region bounded by $x = y - y^2$ and $x = 0$ about the line $y = 2$. 