

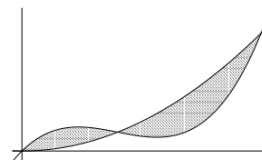
(1) Compute the derivative of the following functions:

(a) $F(x) = \int_{2x}^{x^2} e^{t^2} dt.$

(b) $G(x) = \int_{g(x)}^{h(x)} f(t) dt.$

(c) (Sp14 Final) Let $A(t)$ denote the area under the curve $y = \sqrt{1 - x^3}$ and above the axis, between the vertical lines $x = t$ and $x = 2t$. Find the value of t for which $A(t)$ is a maximum on the interval $0 \leq t \leq 1/2$.

(2) (Wi03 MT1) Compute the total area bounded by the curves $y = x^2$ and $y = x^3 - 6x^2 + 10x$.



(3) Find positive numbers a and b so that both of the following hold

$$\frac{1}{2} \int_{\sqrt{b}}^a x \, dx = 1$$
$$\int_0^{a^3} \frac{1}{x^{2/3}} \, dx = \int_0^{\ln 7} e^x \, dx.$$