



Examples 8.5 – The Fundamental Theorem of Calculus (Part 2)

1. Let $F(x) = \int_0^x \arctan(t^3) dt$. Evaluate each of the following.

Solution: (a) $F(0) =$

(b) $F'(x) =$

(c) $F'(1) =$

2. Find the derivative (with respect to x) of each function.

(a) $f(x) = \int_{-1}^x \left(\frac{1}{3}t^9 - 4t^5\right)^{1/2} dt$ (b) $g(x) = \int_x^1 \left(\frac{1 - \sin t}{2 + \cos t}\right) dt$ (c) $h(x) = \int_0^{2x^3} \ln(t+1) dt$

Solution:

(a)

(b)

(c)

3. Let $F(x) = \int_0^{-x} (t+1)e^t dt$. Find F' and F'' .

Solution: