

Math 101 – WORKSHEET 4
THE FUNDAMENTAL THEOREM OF CALCULUS

(1) (Differentiating integrals) Evaluate

(a) $\frac{d}{dx} \int_0^x e^{t^2} dt$

(b) $\frac{d}{dx} \int_x^1 e^{t^2} dt$

(c) (Final 2009) $\frac{d}{dx} \int_{x^2}^{e^x} \sqrt{\cos t} dt$

(d) (Final 2014) Let $f(x) = \int_1^x 100(t^2 - 3t + 2)e^{-t^2} dt$. Find the interval(s) on which f is increasing.

(2) Evaluate using anti-derivatives

(a) (Final 2012) $\int_1^2 \frac{x^2+2}{x^2} dx =$

(b) (Final 2007) $\int_{-1}^0 (2x - e^x) dx =$

(c) $\int_3^{10} (x^{5/2} + e^{2x}) dx =$