

M1B/Schoenbrun Section 5.3: Fundamental Theorem of Calculus

Compute these integrals EXACTLY, check with your calculator

Find the indefinite integral or compute the definite integral EXACTLY

$$1) \int_1^4 \sqrt{x} \, dx$$

$$2) \int_{-2}^3 |(x+1)(x-1)| \, dx$$

$$3) \int \frac{\cos(x)}{\sin(x)^5} \, dx$$

$$4) \int \frac{t^5 - 4t^3 + t^2 - 8t + 5}{t^2} dt$$

$$5) \int \frac{e^x}{\sqrt{1 - e^{2x}}} dx$$

Find the derivative of each function

$$6) f(x) = \int_1^2 x dx$$

$$7) g(x) = \int_1^x \frac{1}{t^3 + 1} dt$$

$$8) g(x) = \int_1^x e^{t^2 - t} dt$$

$$9) F(x) = \int_x^{\pi} \sqrt{1 + \sec t} \, dt$$

$$13) h(x) = \int_2^{1/x} \arctan(t) \, dt$$

$$14) h(x) = \int_0^{x^2} \sqrt{1+r^3} \, dr$$

$$15) y = \int_0^{\tan x} \sqrt{t + \sqrt{t}} \, dt$$

$$16) y = \int_{e^x}^0 \sin^3(t) \, dt$$

$$17) y = \int_{\sin x}^{\cos x} (1+v^2)^{10} \, dv$$