

## PRACTICE SESSION ON BACKGROUND MATERIAL

**Exercise 1.** Find the equation of the tangent line to the curve  $y = \cos(x)$  at the point with  $x$ -coordinate  $\pi/4$ .

**Exercise 2.** Compute the derivatives of the following functions.

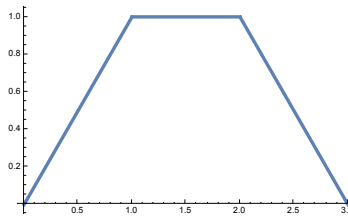
(1)  $20 \ln(x) - 51 \sec x$

(2)  $\sqrt[3]{x} \cdot 3^x$

(3)  $\frac{e^{2x+1}}{\tan x}$

(4)  $\ln(\cos(\sqrt{x}))$

**Exercise 3.** Shown below is the graph of a function  $f$  defined on the interval  $[0, 3]$ .



Find the values of the integrals  $\int_0^1 f(z)dz$ ,  $\int_0^2 f(v)dv$ , and  $\int_{1.5}^3 f(c)dc$ .

**Exercise 4.** Use the interpretation of an integral as an area to evaluate the following definite integrals.

(1)  $\int_{-1}^2 (1-x)dx$

(2)  $\int_{-3}^0 (1 + \sqrt{9-x^2})dx$

**Exercise 5.** Use the fundamental theorem of calculus to evaluate the following definite integrals.

(1)  $\int_0^3 (2 \sin x - e^x)dx$

(2)  $\int_0^1 (x^e + e^x)dx$