

Class 09: The Fundamental Theorem of Calculus

Calculus II

College of the Atlantic. January 26, 2023

1. Below are some amount functions. For each function, find the corresponding rate function:

$$F(t) = 100 . \quad (1)$$

$$F(t) = 100 + 5t + t^2 . \quad (2)$$

$$F(t) = e^t + t^2 . \quad (3)$$

$$F(t) = \sin(t) . \quad (4)$$

2. Below are some rate functions. For each function, find the corresponding amount function:

$$f(t) = 30 . \quad (5)$$

$$f(t) = 10 + t . \quad (6)$$

$$f(t) = 4t^2 + 7t^3 . \quad (7)$$

$$f(t) = e^t . \quad (8)$$

$$f(t) = \sin(t) . \quad (9)$$

3. Evaluate the following definite integrals. Do the answers make sense?

$$\int_0^{10} 5 dt . \quad (10)$$

$$\int_0^{10} 5t dt . \quad (11)$$

$$\int_{-10}^{10} 5t^3 dt . \quad (12)$$

$$\int_0^2 e^t dt . \quad (13)$$

$$\int_0^2 e^x dx . \quad (14)$$

$$\int_0^\pi \sin(t) dt . \quad (15)$$

$$\int_0^{2\pi} \sin(t) dt . \quad (16)$$