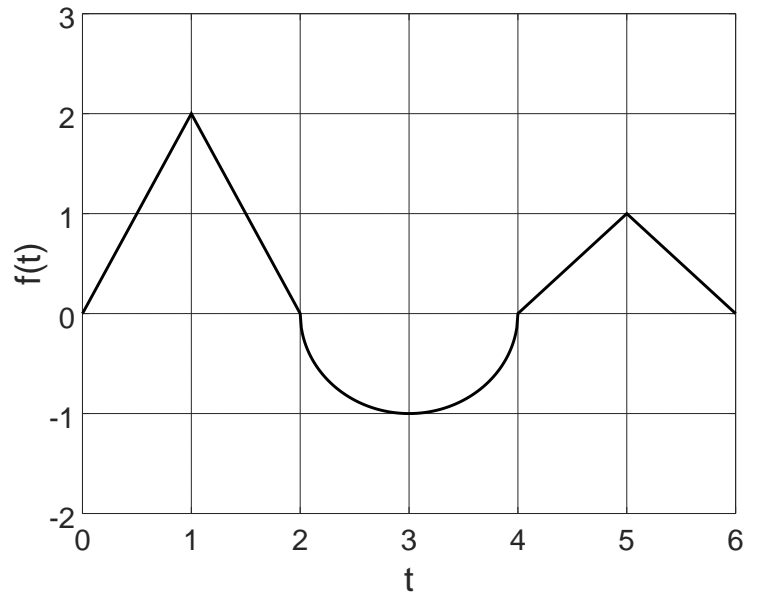


1. (a) The graph of $f(t)$ is at right. Suppose we define the new function

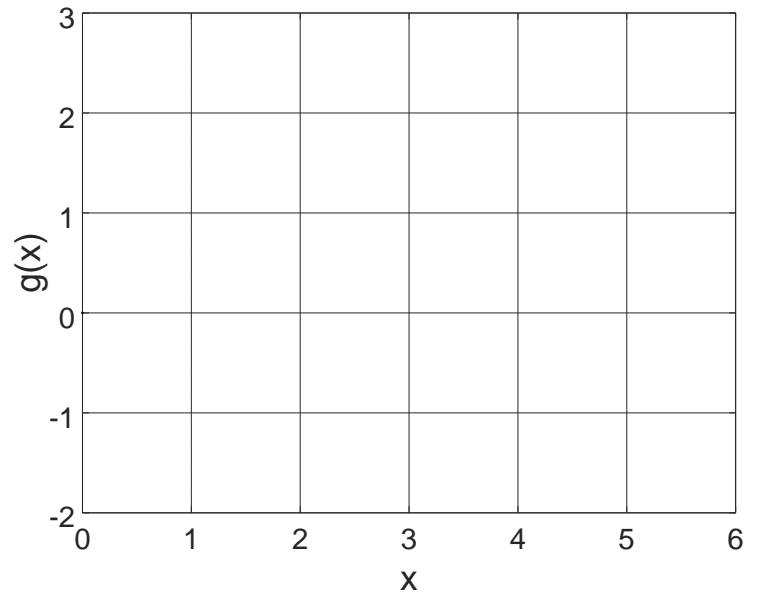
$$g(x) = \int_0^x f(t) dt$$

Sketch $g(2)$ as an area.

- (b) What are the exact values of $g(0)$, $g(2)$, $g(4)$, $g(6)$? (Assume the curved part is circular.)



- (c) Sketch the graph of $g(x)$ on the axes. →
 (d) What is the graph of $g'(x)$?



2. Evaluate the integral:

$$\int_0^1 (1+r)^3 dr =$$

3. Evaluate the integral and interpret as a difference of areas:

$$\int_{\pi/6}^{3\pi/2} \cos x \, dx =$$

4. Evaluate the integral:

$$\int_{1/\sqrt{3}}^{\sqrt{3}} \frac{8}{1+x^2} \, dx =$$

5. (a) Use part II of the Fundamental Theorem of Calculus to compute

$$y(x) = \int_{\cos x}^{\pi} \theta^2 \, d\theta$$

Then differentiate to find dy/dx .

(b) Use part I of the Fundamental Theorem of Calculus, and the chain rule, to find $dy/dx \dots$ and get the same result as in (a).