

Class 10: Exploring a Particular Definite Integral

Calculus II

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1. Evaluate the following integral:

$$\int_0^3 \sin\left(\frac{\pi t^2}{2}\right) dt . \quad (1)$$

You will need to use some python code to do this.

2. Now consider this:

$$S(x) = \int_0^x \sin\left(\frac{\pi t^2}{2}\right) dt . \quad (2)$$

(a) Is this a function of t ?

(b) Is this a function of x ?

3. Sketch the integrand of the integral in Eq. (2). Try it by hand before using a computer.

4. Make a rough sketch of $S(x)$. What is the large- x behavior of $S(x)$?

5. By the way, what is $\frac{d}{dx}S(x)$? Why?