The Indefinite Integral

Aim

To introduce the concept of the indefinite integral.

Learning Outcomes

At the end of this section you will:

- Understand the link between antidifferentiation and integration,

- Understand what is meant by an indefinite integral.

We have previous stated that integration is the reverse of differentiation. For this reason the process of integration is sometimes called finding the antiderivative. Thus, if

$$\frac{d}{dx}[F(x)] = f(x)$$

then integrating (or antidifferentiating) the function $f(x)$ produces an antiderivative of the form $F(x) + C$. Rewriting this idea using integration notation gives

$$\int f(x)dx = F(x) + C$$

where C represents any arbitrary constant.

The expression $\int f(x)dx$ is called an **indefinite integral**. The adjective "indefinite" emphasises the fact that the result of integration is a "generic" result. For this reason an indefinite integral will always result in there being a constant of integration in the answer.

Related Reading

Jacques, I. 1999. *Mathematics for Economics and Business.* 3rd Edition. Prentice Hall.

Morris, O.D., P. Cooke. 1992. *Text & Tests 5.* The Celtic Press.