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error function

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Defines	complementary error function

The *error function* $\operatorname{erf}: \mathbb{C} \rightarrow \mathbb{C}$ is defined as follows:

$$\operatorname{erf}(z) = \frac{2}{\sqrt{\pi}} \int_0^z e^{-t^2} dt$$

The *complementary error function* $\operatorname{erfc}: \mathbb{C} \rightarrow \mathbb{C}$ is defined as

$$\operatorname{erfc}(z) = \frac{2}{\sqrt{\pi}} \int_z^\infty e^{-t^2} dt$$

The name “error function” comes from the role that these functions play in the theory of the normal random variable. It is also worth noting that the error function is a special case of the confluent hypergeometric functions and of the Mittag-Leffler function.

Note. By <http://planetmath.org/SecondFormOfCauchyIntegralTheoremCauchy> integral theorem, the choice path of integration in the definition of erf is irrelevant since the integrand is an entire function. In the definition of erfc , the path may be taken to be a half-line parallel to the positive real axis with endpoint z .