The number ***e*** is an important [mathematical constant](http://en.wikipedia.org/wiki/Mathematical_constant) that is the base of the [natural logarithm](http://en.wikipedia.org/wiki/Natural_logarithm). It is approximately equal to 2.71828,[[1]](http://en.wikipedia.org/wiki/E_(mathematical_constant)#cite_note-1) and is the [limit](http://en.wikipedia.org/wiki/Limit_of_a_sequence) of (1 + 1/*n*)*n* as *n*approaches infinity, an expression that arises in the study of [compound interest](http://en.wikipedia.org/wiki/Compound_interest). It can also be calculated as the sum of the infinite [series](http://en.wikipedia.org/wiki/Series_(mathematics))[[2]](http://en.wikipedia.org/wiki/E_(mathematical_constant)#cite_note-2)

 =  \displaystyle\sum\limits_{n = 0}^{ \infty} \dfrac{1}{n!} = 1 + \frac{1}{1} + \frac{1}{1\cdot 2} + \frac{1}{1\cdot 2\cdot 3} + \cdots

The constant can be defined in many ways; for example, *e* is the unique [real number](http://en.wikipedia.org/wiki/Real_number) such that the value of the [derivative](http://en.wikipedia.org/wiki/Derivative) (slope of the [tangent line](http://en.wikipedia.org/wiki/Tangent_line)) of the function *f*(*x*) = *ex* at the point *x* = 0 is equal to 1.[[3]](http://en.wikipedia.org/wiki/E_(mathematical_constant)#cite_note-3) The function *ex* so defined is called the [exponential function](http://en.wikipedia.org/wiki/Exponential_function), and its [inverse](http://en.wikipedia.org/wiki/Inverse_function) is the [natural logarithm](http://en.wikipedia.org/wiki/Natural_logarithm), or logarithm to [base](http://en.wikipedia.org/wiki/Base_(exponentiation)) *e*. The natural logarithm of a positive number *k* can also be defined directly as the [area under](http://en.wikipedia.org/wiki/Integral) the curve *y* = 1/*x* between *x* = 1and *x* = *k*, in which case, *e* is the number whose natural logarithm is 1. There are also more [alternative characterizations](http://en.wikipedia.org/wiki/E_(mathematical_constant)#Alternative_characterizations).

Sometimes called **Euler's number** after the [Swiss](http://en.wikipedia.org/wiki/Switzerland) [mathematician](http://en.wikipedia.org/wiki/Mathematician) [Leonhard Euler](http://en.wikipedia.org/wiki/Leonhard_Euler), *e* is not to be confused with γ—the [Euler–Mascheroni constant](http://en.wikipedia.org/wiki/Euler%E2%80%93Mascheroni_constant), sometimes called simply *Euler's constant*. The number *e* is also known as **Napier's constant**, but Euler's choice of the symbol *e* is said to have been retained in his honor.[[4]](http://en.wikipedia.org/wiki/E_(mathematical_constant)#cite_note-mathworld-4) The number *e* is of eminent importance in mathematics,[[5]](http://en.wikipedia.org/wiki/E_(mathematical_constant)#cite_note-5) alongside [0](http://en.wikipedia.org/wiki/0_(number)), [1](http://en.wikipedia.org/wiki/1_(number)), [π](http://en.wikipedia.org/wiki/Pi) and [*i*](http://en.wikipedia.org/wiki/Imaginary_unit). All five of these numbers play important and recurring roles across mathematics, and are the five constants appearing in one formulation of [Euler's identity](http://en.wikipedia.org/wiki/Euler%27s_identity). Like the constant π, *e* is [irrational](http://en.wikipedia.org/wiki/Irrational_number): it is not a ratio of[integers](http://en.wikipedia.org/wiki/Integers); and it is [transcendental](http://en.wikipedia.org/wiki/Transcendental_number): it is not a root of *any* non-zero [polynomial](http://en.wikipedia.org/wiki/Polynomial) with rational coefficients. The numerical value of *e* truncated to 50 [decimal places](http://en.wikipedia.org/wiki/Decimal) is

2.71828182845904523536028747135266249775724709369995...