= w , then every solution to ez =
w can be obtained by adding an integer multiple of 2?i to v :
<formula>
Thus the complex exponential function is a periodic function with period 2?i .
More simply : ei?
= ? 1 ; ex + iy =
ex (cos y + i sin y) .

= = = Trigonometric functions = = =

It follows from Euler 's formula stated above that the trigonometric functions cosine and sine are
<formula>
Before the invention of complex numbers , cosine and sine were defined geometrically . The above formula reduces the complicated formulas for trigonometric functions of a sum into the simple exponentiation formula
<formula>
Using exponentiation with complex exponents may reduce problems in trigonometry to algebra .

= = = Complex exponents with base e = = =

The power z = ex + iy can be computed as ex ? eiy . The real factor ex is the absolute value of z and the complex factor eiy identifies the direction of z .

= = = Complex exponents with positive real bases = = =