Answer on Question #45573, Math, Complex Analysis

convert- Z= (i-1)/(cos60+i sin60).

Solution

Let us first transform the denominator

$$\cos 60 + i \sin 60 = 1/2 + \sqrt{3}/2i$$

Now we can use formula for dividing complex numbers

$$\frac{z_1}{z_2} = \frac{a+ib}{c+id} = \frac{(a+ib)(c-id)}{(c+id)(c-id)} = \frac{ac+bd}{c^2+d^2} + \frac{bc-ad}{c^2+d^2}i$$

Hence

$$\frac{-1+i}{1/2+\sqrt{3}/2i} = \frac{-1/2+\sqrt{3}/2}{1/4+3/4} + \frac{1/2+\sqrt{3}/2}{1/4+3/4}i = -1/2+\sqrt{3}/2+(1/2+\sqrt{3}/2)i$$