a)

b)

Let , it holds that

Therefore,

a)

Clearly,

The given complex function is not satisfied first equation of Cauchy-Riemann equation which implies nowhere differentiable.

b)

Assume that and are already satisfied Cauchy-Riemann equation:

Comparing and , we obtain:

Therefore,

Thus, , with be any constant, is complex conjugate of function such that is an analytic function

a)

b)

Given that:

Let , it holds that:

Taking Laplace transform both sides of , we obtain:

Thus, the solution of the given differential equation is: