We want to know how long it takes to recharge the capacitor to 90% of its full capacity. This means we are solving for t when Q=0.9Qo, with a=2a.

We substitute Q=0.9Qo into the inverse function:

t = -2 ln(1-

t=−2ln(1−0.9)

t = -2ln(0.1)

Now, We calculate t:

t=−2× (−2.3026) ≈4.6052 seconds

So, it takes about 4.6 seconds to recharge the capacitor to 90% of its capacity when a=2.