If 7000 dollars is invested in a bank account at an interest rate of 7 percent per year, compounded continuously. How many years will it take for your balance to reach 10000 dollars?

Firstly, we have to "translate" this problem into mathematical language. A certain amount was invested at an interest rate means that annually bank gives his client a certain amount of money as a payment for the ability to use initial amount in financial operations. That means that an amount of money increases as some function

$$M(t + \Delta t) = f(M(t))$$

It's known that $M(0)$ (initial amount of money) equals to 7000. Let v be a fixed value of years, which provides an increasing of initial amount to the value of 10000.

The fact that bank pays annually 7 percents means that

$$M(t + 1) = M(t) \cdot (1 + \frac{7}{100})$$

We know that percents are compounded continuously:

$$M(v) = M(0) \cdot (1 + \frac{7}{100})^v$$

According to the known data,

$$M(v) = 10000, \quad M(0) = 7000$$

we have to solve an equation

$$10000 = 7000 \cdot 1.07^v$$

$$\frac{10}{7} = 1.07^v$$

$$v = \log_{1.07} \frac{10}{7}$$