Final Exam Practice Problems

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1. Tech bro trillionaire Felon Bust is offering me the deal of a lifetime! If I quit my job and give Felon all my cash, he will invest it in his biotech startup Robotomy. Felon tells me that the amount I will receive t months after my investment is given by

$$M(t) := M_0 e^{t/7},$$

where M_0 is the initial amount I give.

"However," says Felon, "Once you invest in my company, it must remain with me until the end of the year. You can't get your money until the start of the new year."

I want to maximize my earnings. If I have \$8000 in my account at the beginning of the year, and make \$4000 per month at my day job, how long should I keep working before I quit my job and give everything over to Felon Bust?