In class PROBLEM:

Assume an attacker is using a processor capable of executing 100 million instructions per second and has designed an algorithm to test passwords that requires 10 instructions. Assume that the attacker has correctly guessed an ID and plans to carry out a brute force attack against all possible passwords to try to get into the account for that ID. How long would you tell the account user to make her/his password, using a combination of alphanumeric string, to ensure that it is reasonably safe for 3 months? Back up your answer with calculations of the time to crack a password of the recommended length.