

Stat Problem

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A computer hacker is trying to break into a computer system by guessing the system administrator's password. The hacker can try 9 passwords a minute, but if he tries unsuccessfully for more than 10 minutes a day, he will get caught. If he limits his attempts to less time each day, he will not get caught. The hacker knows that the administrator's password is at least 6 and at most 12 characters long, does not contain any character that is not a number, an uppercase letter, or a lowercase letter (no special characters such as spaces, punctuation marks, dollar signs, etc.), and that the first character is a letter. Case matters, and characters can be repeated.

How many passwords are there that start with a letter, contain only numbers and upper and lowercase letters, and are at least 6 and at most 12 characters long?

What fraction of the passwords that start with a letter, contain only numbers and upper and lowercase letters, and are at least 6 and at most 12 characters long can the hacker try in 10 years without getting caught? (assume that every year lasts 365.25 days)

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