



Ma2201/CS2022
Quiz 0001

Discrete Mathematics

D Term, MMXVI

Print Name: _____

Sign: _____

1. (8 points) An marketer must choose a name for a new hoverboard. The name is to consist of three consonants, (a,e,i,o,u forbidden) followed by either the word “zoom”, or “boss”, followed by a digit. So perhaps it might be XXT-BOSS-7.

a) How many names are possible?

♣ *The number of non-vowels is $26 - 5 = 21$. There are three such independent choices. Followed by a choice of 2 for ZOOM versus BOSS, followed by a choice of digit, from $\{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}$. Since the choices are independent, we have $21^3 \cdot 2 \cdot 10$.*

Note: There is no advantage to multiplying this all out.

b) The legal department calls and says that when choosing the name, the letter F may not be followed by either C or K. Mathematically (circle one)

a) the choices follow the multiplicative principle.

b) there will be fewer names because of dependence.

c) there will be fewer names because of censorship.

d) there will be fewer names because of independence.

♣ *The number of some choices depend on whether the previous character was an F or not. So b is correct.*

2. (2 pts) My laptop will allow me access if I let it read my fingerprint, type in my password with the keyboard, or say my keyword aloud.

Order these methods from most to least discrete.

♣ *Keyboard entry is most discrete. Voice and fingerprint reading are essentially the same. Both take continuous (analog) input, and compare with a discrete signature, with voice the keyword, with the fingerprint reader the stored discrete signature computed from previous scans.*

So any answer with keyboard in front is correct.