

## Unit 9: Probability

### Example of Post 2: Reply to a Classmate

It's great that you have so many qualified candidates to choose from for your new branch of Hair It Is! As your head of Human Resources, I have also looked through the resumes, and I can help you by eliminating two candidates for each of the positions. Let's see how many ways the branch can be staffed now that we're choosing from 12 hair stylists, 6 nail technicians, and 4 masseuses.

Number of ways hair stylists can be chosen:

$$\begin{aligned} {}_{12}C_7 &= \frac{12!}{(12-7)!7!} \\ &= \frac{12!}{5!7!} \\ &= \frac{12 * 11 * 10 * 9 * 8 * 7!}{5!7!} \\ &= \frac{12 * 11 * 10 * 9 * 8}{5!} \\ &= \frac{95,040}{120} \\ &= 792 \end{aligned}$$

Number of ways nail technicians can be chosen:

$${}_6C_4 = \frac{6!}{(6-4)!4!} = \frac{6!}{2!4!} = \frac{6*5*4!}{2!4!} = \frac{6*5}{2!} = \frac{30}{2} = 15$$

Number of ways masseuses can be chosen:

$${}_4C_3 = \frac{4!}{(4-3)!3!} = \frac{4!}{1!3!} = \frac{4*3!}{1!3!} = \frac{4}{1} = 4$$

So in total, the number of ways the new branch can be staffed is

$$792 * 15 * 4 = 47,520$$