1. Question — You have to solve 5 tasks in parallel and have 5 engineers at your disposal. Each engineer can only work on one task. How many possibilities are there to distribute the tasks?

Answer : $5! = 120$

2. Question — In how many ways can you arrange a card deck of 32 cards?

Answer : $32!$

3. Question — You want to extend your company with two new locations. There are 5 possible spots available. However, due to the current material shortage, you can only build one office at the time. How many possibilities exist to build the two offices?

Answer : $\frac{5!}{(5-2)!} = \frac{120}{6} = 20$

4. Question — You have 6 new features for your website and want to compare them against each other using A/B testing. How many iterations do you need to run?

Answer : $\binom{6}{2} = \frac{6!}{2!(6-2)!} = \frac{6!}{2!*4!} = \frac{720}{48} = 15$

5. Question — You want to find a secure password, consisting of the letters [a-z], [A-Z], and digits 0-9. Imagine a modern computer which can test 1 billion passwords a second. How many characters should your password have so that the attacker would need at least a year to guess it?

Answer : 62 possibilities.
7 characters: $62^7 = 3{,}521{,}614{,}606{,}208 \rightarrow$ 58.5 min
8 characters: $62^8 = 218{,}340{,}105{,}584{,}896 \rightarrow$ 60 hrs
9 characters: $62^9 = 13{,}537{,}086{,}546{,}263{,}552 \rightarrow$ 156.7 days
10 characters: $62^{10} = 839{,}299{,}365{,}868{,}340{,}224 \rightarrow >$ 26 years