In how many ways can a subcommittee of six people be chosen from a Senate committee of seven Democrats and six Republicans if:

a.) all members are eligible?

There are 13 members on this committee, and we just need to pick 6 of them. There are \( \binom{13}{6} = 1716 \) ways to do this.

b.) the subcommittee must consist of three Republicans and three Democrats?

We need to pick 3 of the 6 Republicans (There are \( \binom{6}{3} = 20 \) ways to do this.), and we need to pick 3 of the 7 Democrats (There are \( \binom{7}{3} = 35 \) ways to do this.). Since our choice of Republicans is completely independent from our choice of Democrats, the Multiplication Principle says that there are \( 20 \cdot 35 = 700 \) ways to choose 3 Republicans and 3 Democrats.