Let's compare these methods essentially using one problem.

A) **Select 3 people out of seven where the first person chosen gets \$100, the second person gets \$50 and the third person receives \$25. How many ways can this occur?**

First ting to notice is order matters, I'd rather be picked first and get \$100. And, you can't be picked twice, there are no repetitions.

1) Using the FCP, we have 7 x 6 x 5, 210 ways to distribute that money between 7 people.

or

2) Using the permutation formula, ${}_7P_3$, choosing 3 people out of 7, 7!/(7–3)! = 7 x 6 x5, 210 ways to distribute the money.

Now, making a minor change to the problem, eliminating the importance of ordering.

B. **Select 3 people out of seven, each person receives \$100. How many ways can this occur?**

1) Again, I could use FCP, 7x6x5, but the order of the 3 people does not matter, so I divide out the repeats 3x2x1 – 6. So, I have 35 ways of handing out the money.

or

2) I could have used the permutation formula $\frac{n!}{(n-r)!}$, then divide out the repetition of the 3 people resulting in 7!/[(7–3)!3!]. But wait, when you divide out the repeats, that's the Combination Formula. Don't you just love how this is all connected!

$$nCr = \frac{n\Pr}{r!} = nCr = \frac{n!}{(n-r)!r!} = 7!/[(7-3)!3!] = 35$$