P413 9

We simply have $P(12, 3)=1320$.

So there are 1320 possible orders.

P414 27

a) $C(25, 4)=12650$.

So there are 12650 ways.

b) $P(25, 4)=303600$.

So there are 303600 ways.

P422 31

Assume that there are n elements in the set. When $x=-1$ and $y=1$, from the binomial theorem we can have $\binom{n}{1}+\binom{n}{3}+\cdots=\binom{n}{0}+\binom{n}{2}+\cdots$.

The left side means the number of all the subsets with an odd number of elements, and the right side means the number of all the subsets with an even number of elements. They are equal.

P432 15

a) We can have $C(24, 4)=10626$ solutions.

b) We can have $C(15, 4)=1365$ solutions.

c) We have $C(24, 3)+C(23, 3)+C(22, 3)+C(21, 3)+C(20, 3)+C(19, 3)+C(18, 3)+C(17, 3)+C(16, 3)+C(15, 3)+C(14, 3)=11649$ solutions.

d)If $x1+x2=1$, then $C(7, 2)=21$

If $x1+x2=2$, then $2\cdot C(6, 2)=30$

If $x1+x2=3$, then $3\cdot C(5, 2)=30$

If $x1+x2=4$, then $3\cdot C(4, 2)=18$

If $x1+x2=5$, then $2\cdot C(3, 2)=6$

If $x1+x2=6$, then $C(2, 2)=1$

So there are 21+30+30+18+6+1=106 solutions.

P432 21

We simply have $C(14, 6) =3003$.

So there are 3003 ways.