Power Set

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Power Set

- Determine the power set for the following set

A = {p,q,r,s}

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- The Power Set of A , denoted $\mathcal{P}(A)$, is an exhaustive list of all subsets of set A.

- The empty set Ø and A are two such subsets.

Power Set

- Determine the power set for the following set

A = {p,q,r,s}

- Cardinality of set A is 4
- Cardinality of power set of A is 2^4 , i.e. 16

Size of subset	Subsets	Number of subsets
0	Ø	1
1		4
2		6
3		4
4	{p,q,r,s}	1

Size of subset	Subsets	Number of subsets
0	Ø	1
1	{p},{q},{r},{s}	4
2		6
3		4
4	{p,q,r,s}	1

Size of subset	Subsets	Number of subsets
0	∅	1
1	{p},{q},{r},{s}	4
2		6
3	{q,r,s}, {p,r,s},{p,q,s}, {p,q,r}	4
4	{p,q,r,s}	1

Size of subset	Subsets	Number of subsets
0	∅	1
1	{p},{q},{r},{s}	4
2	{p,q},{p,r},{p,s},{q,r}, {q,s},{r,s}	6
3	{q,r,s}, {p,r,s},{p,q,s}, {p,q,r}	4
4	{p,q,r,s}	1

Size of subset	Subsets	Number of subsets
0	Ø	1
1	{p},{q},{r},{s}	4
2	{p,q},{p,r},{p,s},{q,r}, {q,s},{r,s}	6
3	{q,r,s}, {p,r,s},{p,q,s}, {p,q,r}	4
4	{p,q,r,s}	1

Power Set

Power Set of A

$\mathcal{P}(A)$ = { Ø,{p},{q},{r},{s},{p,q},{p,r},{p,s},
{q,r}, {q,s},{r,s}, {q,r,s}, {p,r,s},
{p,q,s}, {p,q,r}{p,q,r,s} }

Power Set

- N.B. The number of subsets of size ***k*** are ***binomial coefficients***.