2^8	**19%**
2^9	**5%**
2^6	**2%**

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Results gathered from 456 respondents.

FEEDBACK
2^8. The set has (2^3=8) strings, and a set of 8 elements has 2^8 subsets.

1

0 points possible (ungraded)
Rank the functions n^2, 2^n, n from slow to fast in terms of their growth rate as n increases.

- $n, 2^n, n^2$
- $n, n^2, 2^n$ ✔
- $2^n, n, n^2$
- $2^n, n^2, n$

Submit You have used 1 of 2 attempts

Answers are displayed within the problem

2

6.0/6.0 points (graded)
Find the number of 7-character (capital letter or digit) license plates possible if:

- there are no further restrictions,

78364164096 ✔ **Answer:** 78364164096

78364164096

Explanation
In each position there are $26+10=36$ choices (26 letters and 10 digits).
The number of ways is $(26+10)^7 = 36^7 = 78,364,164,096$

- the first 3 characters are letters and the last 4 are numbers,

175760000 ✔ **Answer:** 175760000

175760000

Explanation
For the first 3 positions, the number of ways is 26^3 (letters only).
For the last 4 positions, the number of ways is 10^4 (digits only).
The total number of ways is $26^3 \cdot 10^4 = 175,760,000$

- letters and numbers alternate, for example A3B5A7Q or 0Z3Q4Q9.

632736000 ✔ **Answer:** 632736000

632736000

Explanation
If there are 4 digits and 3 letters, the number of ways is $26^3 \cdot 10^4$.
If there are 4 letters and 3 digits, the number of ways is $26^4 \cdot 10^3$.
The total number of ways is
$26^3 \cdot 10^4 + 26^4 \cdot 10^3 = 175,760,000 + 456,976,000 = 632,736,000$

Submit You have used 3 of 4 attempts

Answers are displayed within the problem

3

0 points possible (ungraded)
If P and Q are sets, then $|P|^{|Q|}$ is the number of functions

- from P to Q,
- from Q to P. ✔

Explanation
The number of functions from Q to P as there are $|P|$ possible images for every element of Q.

Submit You have used 2 of 2 attempts

Answers are displayed within the problem

4

0.0/6.0 points (graded)
Recall that the power set $\mathcal{P}(S)$ of a set S is the collection of all subsets of S.

For $A = \{1, 2, 3\}$ and $B = \{x, y\}$, calculate the following cardinalities.

- $|\mathcal{P}(A)|$

✖ **Answer:** 8

- $|\mathcal{P}(B)|$

✖ **Answer:** 4

- $|A \times B^2|$

4

✖ **Answer:** 12

4

- $|\mathcal{P}(A \times B)|$

✖ **Answer:** 64

- $|\mathcal{P}(A) \times B|$

✖ **Answer:** 16

- $|\mathcal{P}(\mathcal{P}(A))|$

✖ **Answer:** 256

Submit You have used 4 of 4 attempts

Answers are displayed within the problem

5

0 points possible (ungraded)

Let $G = \{0, 2, 4, 6, 8\}$. What is $|G^4|$?

- 5^4 ✔
- 4^5
- $5 \times 4 \times 3 \times 2 \times 1$
- $0 + 2 + 4 + 6 + 8$

Submit You have used 2 of 2 attempts

Answers are displayed within the problem

6

0 points possible (ungraded)
Let A be a set with size 5. How many **proper** subsets does A have?

10 ✖ **Answer:** 31

10

Explanation
A itself is not included. $2^5 - 1 = 31$.

Submit You have used 3 of 3 attempts

Answers are displayed within the problem

7

0 points possible (ungraded)
How many subsets of $\{1, 2, \ldots, 9\}$

- are there,

✖ **Answer:** 512

Explanation
Every element of $\{1, 2, \ldots, 9\}$is an either in the subset of not, hence there are $2^9 = 512$ subsets.

- contain '1',

✖ **Answer:** 256

Explanation

Ever set cotaining '1' corresponds to an abritrary subset of $\{2, 3, \cdots, 9\}$, and there are $2^8 = 256$ such subsets.

- have ≥ 5 elements,

.1 ✖ **Answer:** 256

.1

Explanation

Every subset of size ≥ 5 corresponds to its complement that has size ≤ 4. For example, $\{1, 2, 3, 4, 5\}$has 5 elements, while its complement $\{6, 7, 8, 9\}$has 4 elements. Hence the number of subsets of size ≥ 5 is the same as the number of subsets of size ≤ 4 and together they comprise all 2^9 subsets. Hence the number of subsets of size ≥ 5 is $\frac{2^9}{2} = 2^8 = 256$.

- have no odd elements,

✖ **Answer:** 16

Explanation

Any subset with no odd elements is a subset of of size $\{2, 4, 6, 8\}$and there are $2^4 = 16$ such subsets.

Submit You have used 3 of 3 attempts

Answers are displayed within the problem

Discussion

Topic: Topic 3 / Cartesian Powers

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Questions and comments regarding this section. 2

Staff

Problem 2