

Worksheet 9 Solution

March 18, 2020

Question 1

- a. Every set S of size 0 has $\frac{0(0-1)}{2} = 0$ subsets of size 2
b. Let $n = 0$, and S be an arbitrary set. Assume S has size 0.

Then, S only has empty subsets by the fact that S has size 0.

Since empty subset has size 0, there are 0 subsets with size 2.

c. **Section 1:**

Every set of size k has $\frac{k(k-1)}{2}$ subsets of size 2.

Section 2:

Every set of size $k + 1$ has $\frac{(k+1)k}{2}$ subsets of size 2.

Section 3.1:

Because we know

| Index | Set | # of subsets of size 2 containing last element |
|-------|--------------------------|--|
| 2 | $\{s_1, s_2\}$ | has 1 subset containing s_2 |
| 3 | $\{s_1, s_2, s_3\}$ | has 2 subsets containing s_3 |
| 4 | $\{s_1, s_2, s_3, s_4\}$ | has 3 subsets containing s_4 |

, we can deduce from above that the number of subsets of size 2 containing s_{k+1} is k .

Question 2

Question 3