

Worksheet 9 Review

March 28, 2020

Question 1

- a. For every set of size 0 has 0 subsets of size 2.
- b. Let $n = 0$. Let S be an arbitrary set. Assume S has size 0.

Since S has size 0, empty subsets are the **only** subsets that can be included in S .

Then, because we know empty subsets have size 0, we can conclude there are 0 subsets of size 2.

It follows from above that the base case holds.

Correct Solution:

We want to show every set S of size 0 has 0 subsets of size 2.

Since S has size 0, empty subsets are the **only** subsets that can be included in S .

Then, because we know an empty subset have size 0, we can conclude there are 0 subsets of size 2.

Notes:

- Professor specifically mentions **We want to show every set S of size 0 has 0 subsets of size 2**
- Professor doesn't include conclusion at the end of proof
- Under which cases conclusion to a proof are included.

c. Now we will prove inductive step.

Let $k \in \mathbb{N}$. Assume every set of size k has $\frac{k(k-1)}{2}$ subsets of size 2.

We want to show a set of size $k + 1$ has $\frac{(k+1)k}{2}$ subsets of size 2.

Question 2

Question 3