

1) How many elements must a set have if the number of proper subsets of the set is $\frac{1}{2}$ of the total number of subsets of the set?

2) Evaluate the following expression:

$$\binom{20}{1} + \binom{20}{2} + \cdots + \binom{20}{19}$$

3) True or false?

Suppose A is a set of cardinality n , and suppose we have $r + s = n$. Then the number of subsets of A which have r elements is the same as the number of subsets of A which have s elements.

4) Suppose a group of 5 men and 7 women want to pick a 5-person team. How many teams can they make with 3 men and 2 women.

5) Determine the equality of following statements:

$$A - (A - B) \quad \& \quad A \cap B$$