

In case anybody does both grad and undergrad for number 4, grads **earn 3** extra points and undergrads **earn 5** extra points.

1. (6 points) What is the power set of $\{a, b, c, d\}$?

Note: a fast check is for 16 items. If there aren't 16 it's wrong.

2. (6 points) Suppose $A \subset B$. Show that $2^A \subset 2^B$.

3. (6 points) Let $A = \{2, 4, 6, 8, 10, 12\}$, $B = \{1, 3, 6, 9, 12\}$ and then $\Omega = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}$. What are:

What are each of the following:

- $\Omega \setminus (A \cup B)$
- $A \cap B$
- $A \cup B$

4. (7 points)

– Undergrad: Show $A^C \cap B^C = (A \cup B)^C$

– Grad: Show $A^C = (A^C \cap B) \cup (A^C \cap B^C)$