

Examlet 2 Foundations of Advanced Math 2/26/16

1. Let $A = \{a, b, c\}$ and let $B = \{b, c\}$.

a) True or False: $a \in A$

b) True or False: $A \in B$

c) True or False: $B \in A$

d) True or False: $a \subseteq A$

e) True or False: $\{a\} \in A$

f) True or False: $\{a\} \subseteq A$

g) True or False: $a \in \mathcal{P}(A)$

h) True or False: $a \subseteq \mathcal{P}(A)$

i) True or False: $B \in \mathcal{P}(A)$

j) True or False: $\mathcal{P}(B) \subseteq \mathcal{P}(A)$

2. a) If $A \subseteq B$ and $A \subseteq C$, then $A \cup B \subseteq C$.

b) If $A \subseteq B$ and $A \subseteq C$, then $A \cap B \subseteq C$.

3. For each $n \in \mathbb{N}$, let $A_n = \left[0, \frac{1}{n+1}\right)$.

a) What is $\bigcap_{n \in \{1,2,3\}} A_n$?

b) What is $\bigcup_{n \in \{1,2,3\}} A_n$?

c) What is $\bigcap_{n \in \mathbb{N}} A_n$?

d) What is $\bigcup_{n \in \mathbb{N}} A_n$?

4. $\forall x \in \mathbb{R}, |x| \geq 0$.

5. Suppose $r \in \mathbb{R}$, and $r \geq 1$. Then $r^n \geq 1$ for all $n \in \mathbb{N}$.

