The following quiz contains questions about mathematical notation that you should know about. I'll review the information quickly in class. Take the quiz when you have the time and check your answers. **Do NOT hand the quiz in**. You may have some questions like this on your first test. For your information:

- 2^X denotes the power set of X; that is, the set of all subsets of X. It is also denoted by $\mathcal{P}(S)$.
- $\mathbb{Z}$ denotes the set of integers: $0,\ \pm 1,\ \pm 2, \ldots$.

1. Which of the following are true and which are false?
   (a) $\emptyset \subseteq \emptyset$
   (b) $\emptyset \in \emptyset$
   (c) $\emptyset \in 2^{\emptyset}$
   (d) $\emptyset \subseteq 2^{\emptyset}$
   (e) $\mathbb{Z} \subseteq \mathbb{Z}$
   (f) $\mathbb{Z} \in \mathbb{Z}$
   (g) $\emptyset \in \mathbb{Z}$
   (h) $\emptyset \subseteq \mathbb{Z}$

2. Which of the following are true statements about our world?
   (a) Dogs can fly if and only if pigs have wings.
   (b) If dogs can fly, then pigs have wings.
   (c) Dogs can fly only if pigs do not have wings.

3. Describe the following sets in English as simply as possible.
   (a) $2^{\emptyset}$
   (b) $\{2k : k \in \mathbb{Z}\}$
   (c) $\{k + 37 : k \in \mathbb{Z}\}$
   (d) $\{2k : k \in \mathbb{Z}\} \cap \{3k : k \in \mathbb{Z}\}$
   (e) $2\mathbb{Z} \cap 3\mathbb{Z}$