Exercise using Nested Quantifiers

Let $P(x, y)$ be the statement, "person x has seen movie y," where the domain for x is the set of all people and the domain for y is the set of all movies ever released.

Translate the following statements into symbols using $P(x, y)$, quantifiers and logical connectives.

1. Everyone has seen at least one movie.

2. Some movies have been seen by everyone.

3. Nobody has seen every movie.

4. Every movie has been seen by at least one person.

5. Everyone has seen either Star Wars or Casablanca.

6. At least two people have seen Star Wars.

Let $S(x)$ be the statement, "person x has seen Star Wars," where the domain for x is the set of all people.

Translate the following statements into symbols using $S(x)$, quantifiers and logical connectives.

1. At least two people have seen Star Wars.

2. At most one person has seen Star Wars.

3. Exactly one person has seen Star Wars. [Do not use the uniqueness $\exists!$ quantifier.]

4. Exactly two people have seen Star Wars.