1. Let $C$ be a set of courses, and let $P(x, y)$ mean course $x$ is a prerequisite for course $y$. Rewrite the following symbolically:

(a) “There is no prerequisite for CSC108.”
(b) “Every course has a prerequisite.”
(c) “Some course is not a prerequisite for any course.”
(d) “No course is a prerequisite for itself.”
(e) “Some courses have several prerequisites.”
(f) “No course has more than two prerequisites.”
(g) “Some courses have the same prerequisites.”

2. Which are true, which are true in one direction, and which are false both directions? Explain your answers.

(a) $\forall x \in D, P(x) \land Q(x) \iff (\forall x \in D, P(x)) \land (\forall x \in D, Q(x))$
(b) $\exists x \in D, P(x) \land Q(x) \iff (\exists x \in D, P(x)) \land (\exists x \in D, Q(x))$
(c) $\forall x \in D, P(x) \lor Q(x) \iff (\forall x \in D, P(x)) \lor (\forall x \in D, Q(x))$
(d) $\exists x \in D, P(x) \lor Q(x) \iff (\exists x \in D, P(x)) \lor (\exists x \in D, Q(x))$