Predicate Logic (Exercise)

Translate the following sentences into predicate logic (1 - 10)

1) Some integers are even and some integers are odd.

2) All integers are even

3) If an integer is not even, then it is odd.

4) Some integers are odd.

5) A number is even only if it is integer.

6) All sins is a form of lying

7) Jeff is happy.

8) Tom and Jerry are both dogs.

9) Jack is happier than Tim, but sadder than Bob.

10) Paul is a trouble maker when Ben dislikes him.

12) Prove $\neg \forall x\, P(x) \equiv \exists x \neg P(x)$

13) Prove $\forall x (P(x) \vee Q(x)) \not\equiv \forall x\, P(x) \vee \forall x\, Q(x)$

14) Prove $\exists x (P(x) \wedge Q(x)) \not\equiv (\exists x\, P(x) \wedge \exists x\, Q(x))$