Translate the following sentences into the language of predicate logic, as accurately as possible, and use variables for all quantified expressions.

\[ Jx = x \text{ jumps.} \]
\[ Kx = x \text{ is a kangaroo.} \]
\[ Rx = x \text{ is a rabbit.} \]
\[ Hx = x \text{ hops.} \]
e = Elmore
r = Rosco

Example:
“There is a kangaroo who hops.”
\[ \exists x (Kx \& Hx) \]

1. Elmore, the kangaroo, is hopping.

2. All rabbits and kangaroos hop.

3. Rosco is either a kangaroo or a rabbit.

4. If Elmore doesn’t jump, then no kangaroos jump.

5. There is a rabbit that hops, but it isn’t Elmore.

6. Unless Rosco doesn’t jump or hop, all rabbits jump or hop.

7. No rabbit or kangaroo is hopping.

8. If there are any hopping rabbits, Rosco is one of them.

9. If Elmore doesn’t jump, then no kangaroos jump.

10. Not all kangaroos hop; some jump instead.

11. No rabbits fail to hop, but some kangaroos do.
12. If Elmore hops, then he is either a kangaroo or a rabbit.

13. There is no such thing as a rabbit-kangaroo.