Which of the following formalizes the definition of the predicate $Pr(x)$ over the set of integers, and evaluates to T exactly when x is prime. (Select all and only correct options.)

1. $\forall a \in \mathbb{Z}^{\neq 0}\ (\ (x > 1 \wedge a > 0) \rightarrow F(\ (a, x)\ ))$
2. $\neg \exists a \in \mathbb{Z}^{\neq 0}\ (x > 1 \wedge (a = 1 \vee a = x) \wedge F(\ (a, x)\ ))$
3. $(x > 1) \wedge \forall a \in \mathbb{Z}^{\neq 0}\ (\ (\ a > 0 \wedge F(\ (a, x)\ )\ ) \rightarrow (a = 1 \vee a = x)\ )$
4. $(x > 1) \wedge \forall a \in \mathbb{Z}^{\neq 0}\ (\ (\ a > 1 \wedge \neg(a = x)\ ) \rightarrow \neg F(\ (a, x)\ )\ )$