

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