## (, a) AG ( $p \rightarrow (E \times (q) \lor (E \times (q) \land E \times E \times (q)) \lor (E \times (q) \land E \times E \times E \times (q))$ $\lor (E \times (q) \land E \times E \times (q) \land E \times E \times E \times E \times E \times (q))$

## b) EF (AF(P) ^ AF(a) ^ AG(P→79 ^ Q→7P))

2. a) T= \( (7e \n 7b \a'\n 7b') \var\) \( (7a \n 7b \n 7a' \b') \\
\( \( (7a \n b \n 7a' \n b') \var\) \\
\( \( (a \n b \n 7a' \n b') \var\) \\
\( \( (a \n b \n 7a' \n b') \var\) \\
\( \( (7a \n b \n 7a' \n b') \\) \\
\( \( (7a \n b \n 7a' \n 7b') \\) \\

Ab(true) = [b] ARV(RVCtrue) = [b]

Ab(true) = [b] 1 Ru(Ru(b))

= b 1 RV(Vab(T1b))

= bΛ βy ((ταλτόλταιλό)) ν (ταλόλταιλό) ν (αλτόλαιλό) ν (αλόλταιλό))

Ap(Z)=[4] 1 Ry(Ry(Z))

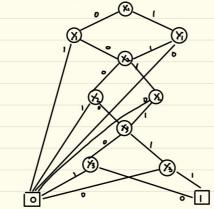
=(10( N b) 7a'N b') V (anb N7a'N b'))

 $Ab^{3}$ (true) =  $b \wedge RV(ba'b' (T \wedge (1 a \wedge b \wedge 1a' \wedge b')) \vee (a \wedge b \wedge 1a' \wedge b'))$ 

= b N((7an1bn7a'nb') V(anbn7a'nb'))

= (7ahbn7a'nb')V(ahbn7a'nb'))

## 3. B= ((x, 1/2) v (7x, 17x)) 1 ((x, 1/2) v (7x21x2)) 1 ((x31/3) v (7x3 17/3))



## 4. a)

Firstly, check if node n. and nz are both true or take, if not then return true. If they are same, check if their left children are both true or not, if not then check if their night children are both true or take. If their right children are not same, return true.

So, wit tunction is to deale two nodes and their Children are some things. if structure  $n_i$  is the app of  $n_2$   $\Rightarrow$  false otherwise, true.

b) Puntine: O(n)