

HW FOR WEEK 9

1. Name all of the free and bound variables in the following expressions.

(a) $(+i|1 \leq i \leq 5 : i^2) \cdot (+i|6 \leq i \leq 10 : i^k)$

(b) $(+j|6 \leq j \leq 10 : i^j)$

(c) $(\wedge i|1 \leq i \leq n : A_i \equiv B_i)$

(d) $(\forall i|1 \leq i \leq n : p \Rightarrow (a = i))$

2. Determine whether the following quantifiers are true or false. Justify your answer.

(a) $(\forall x|(x = 1) \wedge (x = 2) : 2x = 4)$

(b) $(\forall x|(x = 1) \vee (x = 2) : 2x = 4)$

(c) $(\exists x|(x = 1) \wedge (x = 2) : 2x = 4)$

(d) $(\exists x|(x = 1) \vee (x = 2) : 2x = 4)$

(e) $(\forall x : 2x = 4)$

(f) $(\exists x : 2x = 4)$

3. Compute the following sums.

(a) $(+i|0 \leq i \leq 3 : 2^i)$

(b) $(+i|(0 \leq i \leq 6) \wedge (\text{even}.i) : 3i - 1)$

(c) $(+i|(i = 1) \vee (i = 6) \vee (i = 13) : i)$

(d) $(+i|(i > 0) \wedge (i < 0) : 1/i^2)$