

Homework 1.3 - Graded 3 and 9bcd

Note Title

1/30/2006

#3 Domain - US states

$Q(x, y)$ - x is north of y

$P(x)$ - x starts with the letter M

a - Mississippi

F
T
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F
T

a) $(\forall x) P(x)$ - F Ohio!

b) $(\forall x)(\forall y)(\forall z) [Q(x, y) \wedge Q(y, z) \rightarrow Q(x, z)]$ - T

c) $(\exists y)(\exists x) Q(y, x)$ - T Michigan is north of Alabama

$$d) (\forall x)(\exists y) [P(y) \wedge Q(x,y)] - F$$

x - Hawaii - ~~∃y~~ / y is south of Hawaii

$$e) (\exists y) Q(a,y) \cdot \neg (y = \text{Hawaii})$$

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b) No woman is both a lawyer and a chemist

$$(\forall x) [L(x) \wedge C(x) \rightarrow \neg W(x)]$$

c) Some lawyers admire only judges.

$$(\exists x)(\forall y) [L(x) \wedge A(x,y) \rightarrow J(y)]$$

d) All judges admire only judges

$$(\forall x)(\forall y) [J(x) \wedge A(x, y) \rightarrow J(y)]$$

Watch : The following are wrong - why?

1. $(\forall x) [J(x) \wedge (\forall y) [A(x, y) \rightarrow J(y)]]$

2. $(\forall x)(\forall y) [J(x) \wedge J(y) \rightarrow A(x, y)]$

3. $(\forall x) [J(x) \wedge (A(x, y) \rightarrow J(x))]$

9c. The following is wrong:

$$1. (\exists x) [L(x) \rightarrow (\forall y) [A(x,y) \rightarrow J(y)]]$$