

**Homework 18 p.243-4: 1,2acdfgij;3;4;5e-k**

(5e) No ducks are amphibious

$$\forall x(D(x) \rightarrow \sim A(x))$$

or  $\sim \exists x(D(x) \& A(x))$

(5f) Every cloud has a silver lining

$$\forall x(C(x) \rightarrow \exists y(L(y) \& H(x,y)))$$

$L(y)$  = y is a silver lining

$H(x,y)$  = x has y

(5g) Only Rosicrucians experience complete happiness

$$\forall x(E(x) \rightarrow R(x))$$

$E(x)$  = x experiences complete happiness

$R(x)$  = x is a Rosicrucian

(5h) Everything I like is immoral, illegal, or fattening

$$\forall x(L(i,x) \rightarrow (\sim M(x) \vee \sim G(x) \vee F(x)))$$

$L(i,x)$  = I like x

$M(x)$  = x is moral

$G(x)$  = x is legal

$F(x)$  = x is fattening

(5i) I like anything that is immoral, illegal or fattening

$$\forall x((\sim M(x) \vee \sim G(x) \vee F(x)) \rightarrow L(i,x))$$

(5j) Everyone wants everyone to be rich

$$\forall x \forall y((P(x) \& P(y)) \rightarrow W(x,y))$$

$W(x,y)$  = x wants y to be rich.

(5k) Everyone wants to be rich

$$\forall x(P(x) \rightarrow W(x,x))$$

*For all other answers, see the book.*