AI2 13th Week

問1 1. $\neg(p \to (p \vee q))$

X $= \neg(\neg p \vee (p \vee q))$

$= p \wedge \neg(p \vee q)$

$= p \wedge (\neg p \wedge \neg q)$

$= \neg q$

2 ○ 3. X 4 X 5. ○

6. $\theta \circ \lambda = \{\{f(y)\lambda/x, z\lambda/y\}, \lambda\}$

X

$= \{\{f(z)/x, b/y\} \cup \{a/x, b/z\}\}$

$= \{f(z)/x, b/y, b/z\}$

$\lambda \circ \theta = \{a\theta/x, b\theta/z\}, f(y)/x, z/y\}$

$= \{a/x, b/z, z/y\}$

7 ○, 8 X

9. $-\log_2 \frac{1}{20} = \log_2 20 = \log_2 4 \times 5$

X $= 2 + \log_2 5$

10. X

問2 1. $\neg > \wedge > \vee > \rightarrow > \equiv$

2. 略

3. 略

4. $\forall x \exists y ((P(x,y) \rightarrow Q(x)) \wedge \neg(\forall x \exists y (P(x,y) \rightarrow \forall z R(z))))$

$= \forall x \exists y ((\neg P(x,y) \vee Q(x)) \wedge \neg(\exists x \forall y (P(x,y) \rightarrow \forall z R(z))))$

$= \forall x \exists y ((\neg P(x,y) \vee Q(x)) \wedge (\exists x \forall y \neg(P(x,y) \rightarrow \forall z R(z))))$

$= \forall x \exists y ((\neg P(x,y) \vee Q(x)) \wedge (\exists x \forall y (P(x,y) \wedge \exists z \neg R(z))))$

$= \forall x \exists y \exists z \forall u \forall v ((\neg P(x,y) \vee Q(x)) \wedge P(u,v) \wedge \neg R(z))$

5. $\forall x \forall v ((\neg P(x, f(x)) \vee g(x)) \wedge P(g(x), v) \wedge \neg R(h(x,v)))$

6. $\{\{\neg P(x, f(x)), g(x)\}, \{P(g(x), v)\}, \{\neg R(z)\}\}$

7-1. $\{f(x)/u, x/y, h(w)/z\}$

7-2. $\{f(y)/v, w/u, f(y)/z\}$

7-3 $\{a/z, h(a, g(y))/x, g(y)/w\}$

問3 $P(D) = P(D|A,B)P(A)P(B) + P(D|\neg A,B)P(\neg A)P(B) +$
$P(D|A,\neg B)P(A)P(\neg B) + P(D|\neg A,\neg B)P(\neg A)P(\neg B)$
$= 0.656$

$P(A,B,D) = P(D|A,B)P(A,B)$
$= P(D|A,B)P(A)P(B) = 0.378$

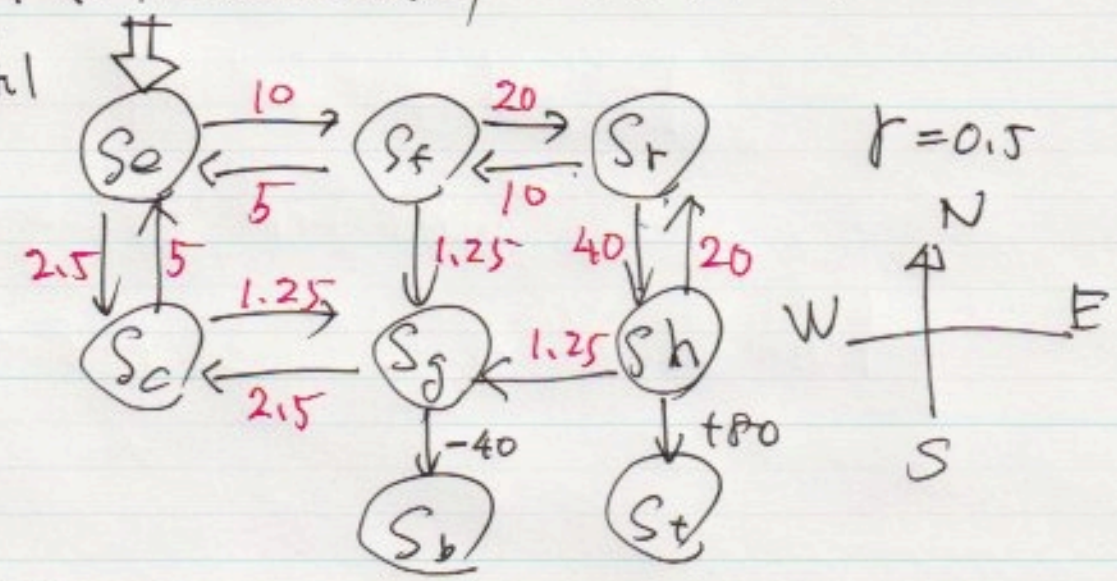
$P(D|A) = P(D|A,B)P(B) + P(D|A,\neg B)P(\neg B)$
$= 0.74$

$P(C|\neg E) = \dfrac{P(\neg E|C)P(C)}{P(\neg E)} = 0.2$

$P(\neg E) = P(\neg E|C)P(C) + P(\neg E|\neg C)P(\neg C) = 0.5$

$P(F|A,B,C,D,E) = P(F|D,E) = 0.8$

問4 4.1



4.2 (E, E, S, S)

$\Rightarrow S_e \xrightarrow{E} S_f \xrightarrow{E} S_r \xrightarrow{S} S_h \xrightarrow{S} S_t$