TASK 1

$$\frac{1}{|\mathcal{C}|} = \frac{P(c_{-T}, R_{-T}, S_{-T}, W_{-T})}{P(R_{-T}, S_{-T}, W_{-T})} = \frac{P(R_{-T}|c_{-T}) \cdot P(w_{-T}|S_{-T}, R_{-T}) \cdot P(w_{-T}|S_{-T}, R_{-T})}{P(w_{-T}|S_{-T}, R_{-T}) \cdot P(S_{-T}) \cdot P(S_{-T})} = \frac{P(R_{-T}|c_{-T}) \cdot P(w_{-T}|S_{-T}, R_{-T}) \cdot P(S_{-T}) \cdot P(S_{-T})}{Q(S_{-T}, S_{-T}, W_{-T})} = \frac{Q(S_{-T}|c_{-T}) \cdot P(S_{-T}|c_{-T}) \cdot P(S_{-T}|c_{-T})}{Q(S_{-T}, S_{-T}, W_{-T})} = \frac{Q(S_{-T}|c_{-T}, S_{-T}|w_{-T})}{Q(S_{-T}|c_{-T})} = \frac{Q(S_{-T}|c_{-T}|c_{-T}) \cdot P(S_{-T}|c_{-T})}{Q(S_{-T}|c_{-T})} \cdot P(S_{-T}|c_{-T})} = \frac{Q(S_{-T}|c_{-T}|c_{-T}) \cdot P(S_{-T}|c_{-T})}{Q(S_{-T}|c_{-T})} = \frac{Q(S_{-T}|c_{-T}|c_{-T})}{Q(S_{-T}|c_{-T})} = \frac{Q(S_{-T}|c_{-T}|c_{-T})}{Q(S_{-T}|c_{-T})} = \frac{Q(S_{-T}|c_{-T}|c_{-T})}{Q(S_{-T}|c_{-T}|c_{-T})} = \frac{Q(S_{-T}|c_{-T}|c_{-T}|c_{-T})}{Q(S_{-T}|c_{-T}|c_{-T}|c_{-T})} = \frac{Q(S_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T})}{Q(S_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|c_{-T}|$$

p(5=T)= p(s=T|c=T) · p(c=T)+ p(s=T|c=F) · p(c=F) = 0,1 · 0,5 + 0,5 · 0,5 = 0,3

p(R=T) = p(R=T | C=T) · p(C=T) + p(R=T | C=F) · p(C=F) = 0,8 ·0,5 + 0,2 ·0,5 = 0,5

$$\frac{\partial P(C|\overline{R},S,w) = \frac{P(C,\overline{R},S,w)}{P(\overline{R},S,w)} = \frac{P(\overline{R}|C) \cdot P(S|C) \cdot P(C)}{P(S) \cdot P(\overline{R})}$$

$$= \frac{0,7.0,1.9,5}{0,3.9,5} = 0.067$$

3)
$$P(R|C,5,W) = \frac{P(R,C,S,W)}{P(C,S,W)} = \frac{P(R|C) \cdot P(stc) \cdot P(w|R,S) \cdot p(t)}{P(C,S,W)}$$

p(w|s) = p(w|s, R). p(R) + p(w|s, R). p(R) = 0,99.0,5+0,9.0,5=0,945

$$4) P(R|\overline{C}, S, W) = \frac{P(R, \overline{C}, S, W)}{P(\overline{C}, S, W)} = \frac{P(R|\overline{C}) \cdot P(S+\overline{C}) \cdot P(W|R, S) \cdot P(\overline{C})}{P(\overline{C}) \cdot P(S+\overline{C}) \cdot P(W|S)} = \frac{P(R|\overline{C}) \cdot P(S+\overline{C}) \cdot P(W|S)}{P(\overline{C}) \cdot P(S+\overline{C}) \cdot P(W|S)} = \frac{P(R|\overline{C}) \cdot P(S+\overline{C}) \cdot P(W|S)}{P(\overline{C}) \cdot P(S+\overline{C}) \cdot P(W|S)} = \frac{P(R|\overline{C}) \cdot P(S+\overline{C}) \cdot P(W|S)}{P(\overline{C}) \cdot P(S+\overline{C}) \cdot P(W|S)} = \frac{P(R|\overline{C}) \cdot P(S+\overline{C}) \cdot P(W|S)}{P(\overline{C}) \cdot P(W|S)} = \frac{P(R|\overline{C}) \cdot P(S+\overline{C}) \cdot P(W|S)}{P(\overline{C}) \cdot P(S+\overline{C}) \cdot P(W|S)} = \frac{P(R|\overline{C}) \cdot P(S+\overline{C}) \cdot P(W|S)}{P(\overline{C}) \cdot P(S+\overline{C}) \cdot P(W|S)} = \frac{P(R|\overline{C}) \cdot P(S+\overline{C}) \cdot P(W|S)}{P(\overline{C}) \cdot P(S+\overline{C}) \cdot P(W|S)} = \frac{P(R|\overline{C}) \cdot P(S+\overline{C}) \cdot P(W|S)}{P(\overline{C}) \cdot P(S+\overline{C}) \cdot P(W|S)} = \frac{P(R|\overline{C}) \cdot P(S+\overline{C}) \cdot P(W|S)}{P(\overline{C}) \cdot P(W|S)} = \frac{P(R|\overline{C}) \cdot P(W|S)}{P(\overline{C})} = \frac{P(R|\overline{C}) \cdot$$

$$P(R=T|S=T,W=T) = \frac{P(R,S,W)}{P(S,W)} = \frac{P(R).P(S).P(W|R,S)}{P(W|S).P(S)}$$

$$=\frac{0.5 \cdot 0.99}{0.945} = 0.574$$