3.2 $R_H = \frac{1}{4}(A+B+C+D)$

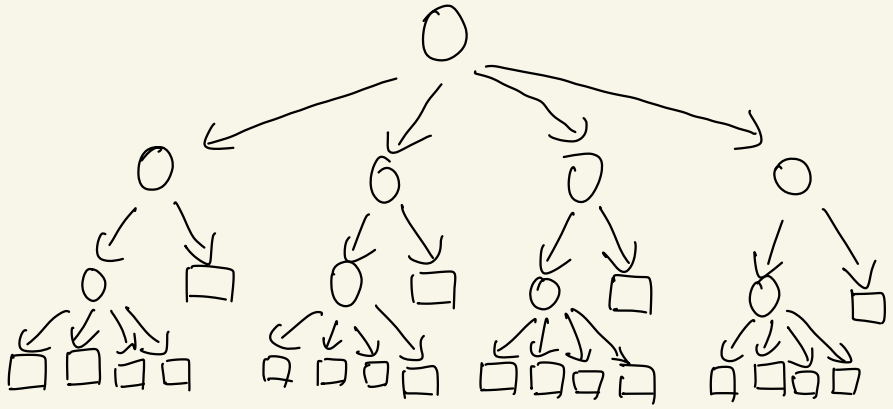
$R_{AH} = \frac{1}{4}D + \frac{1}{4}[Dp + A(1-p)] + \cdots + \frac{1}{4}[Dp + C(1-p)]$

$= D\left(\frac{1}{4} + \frac{3}{4}p\right) + (A+B+C)\cdot\frac{1}{4}(1-p)$

3.3 $R_{AH} > R_H \iff D(1+3p) + (A+B+C)(1-p) > A+B+C+D$

$\iff D\cdot 3p - (A+B+C)\cdot p > 0 \iff 3D > A+B+C$

4.1



4.2 $R_{DH} = \frac{1}{4}\left[D(1-p) + (A+B+C)\frac{p}{3}\right] + \frac{1}{4}[Dp + A(1-p)]$

$+ \frac{1}{4}[Dp + B(1-p)] + \frac{1}{4}[Dp + C(1-p)]$

$= D\cdot\frac{1}{4}(1-p+3p) + (A+B+C)\cdot\frac{1}{4}\left(\frac{p}{3} + 1 - p\right)$

4.3 $R_{DH} > R_{AH} \iff D(-p) + (A+B+C)\cdot\frac{p}{3} > 0$

$\iff A+B+C > 3D$