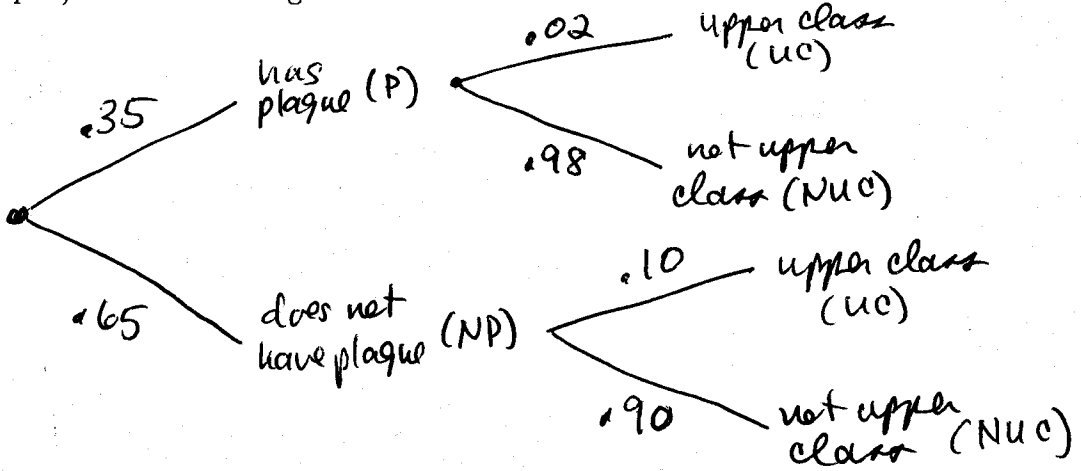
MATH 110 – QUIZ 9 – 30 OCTOBER 2009

Answer all of the following questions in the space provided.

1. In a certain town in Medieval Europe, 35% of the population has plague, and 65% do not have plague. 2% of those with plague are from the Upper Class, and 10% of those without plague are from the Upper Class.

(a) (4 pts.) Draw a tree diagram that illustrates the situation described above.



(b) (3 pts.) What is the probability that a person selected at random from the town is not from the Upper Class?

$$\begin{aligned} Pr(NUC) &= Pr(NUC \cap P) + Pr(NUC \cap NP) \\ &= Pr(P)\,Pr(NUC|P) + Pr(NP)\,Pr(NUC|NP) \\ &= (.35)(.98) + (.65)(.90) \\ &= .928 \end{aligned}$$

(c) (3 pts.) What is the probability that a person selected at random from the town has plague given that he or she is not from the Upper Class.

$$Pr(P|NUC) = \frac{Pr(P \cap NUC)}{Pr(NUC)} = \frac{(.35)(.98)}{.928}$$

$$\approx .37$$