MATH 110 – QUIZ 10 – 2 NOVEMBER 2006

Answer all of the following questions in the space provided.

1. A certain town in Medieval Europe has experienced an outbreak of plague. Suppose that the incidence of plague among the townspeople is described in the following table.

	Rich	Middle Class	Poor
Has plague	6	250	750
Does not have plague	54	550	1250

(a) (2 pts.) What is the probability that a person selected at random from the town has plague?

E = "person has plague"

$$Pr(E) = \frac{\#\text{ with plague}}{\#\text{ in town}} = \frac{6+250+750}{6+250+750+54+550+1250}$$

$$= \frac{1006}{2860} \approx .35 //$$

(b) (2 pts.) What is the probability that a person selected at random from the town is poor?

E = "person is poor"

$$Pr(E) = \frac{\#\text{ poor}}{\#\text{ in town}} = \frac{750+1250}{2860} = \frac{2000}{2860} \approx .70 //$$

(c) (3 pts.) What is the probability that a person selected at random from the town has plague given that he or she is from the Middle Class.

E = "has plague" M = "from middle class"

$$Pr(E|M) = \frac{250}{250+550} = \frac{250}{800} \approx .31 //$$

(d) (3 pts.) What is the probability that a person selected at random from the town is from the Middle Class given that he or she has plague?

$$Pr(M|E) = \frac{250}{6+250+750} = \frac{250}{1006} \approx .25 //$$