MATH 5010 – Quiz 4

Name:

Date:

2.9 A retail establishment accepts American express and VISA credit cards. A total of 24 percent of its customers carry an American Express card, 61 percent carry a VISA card, and 11 percent carry both cards.

1. A customer is selected at random. What is the probability that this customer carries a credit card that the establishment will accept?

$$.24 + .61 - .11$$

$$= \boxed{.74}$$

2. Prove that $P(\{\}) = 0$ using only the axioms.

Let $E_1 = S$

$E_i = \emptyset$ for $i = 2, 3, \cdots$

Then $1 = P(S) = P\left(\bigcup E_i\right) = \sum P(E_i) = P(S) + \sum_{i=2}^{\infty} P(E_i)$

$= 1 + \sum_{i=2}^{\infty} P(\emptyset)$

$\Rightarrow P(\emptyset) = 0$ since $P(\emptyset) \geq 0$ and $\sum P(\emptyset) = 0$