1. Review of Principal Points:

- \( \sigma \) algebra: \( \mathcal{B} \) is called a \( \sigma \)-algebra or \( \sigma \)-field if and only if it satisfies three properties. What are they?
  
  Suppose sample space \( \Omega = \{1, 2, 3, 4, 5\} \). Is \( \mathcal{B}_1, \mathcal{B}_2 \) \( \sigma \)-algebra?
  
  \[ \mathcal{B}_1 = \{\emptyset, \Omega, \{1\}, \{3, 4, 5\}, \{2, 3, 4, 5\}\} \quad \mathcal{B}_2 = \{\emptyset, \Omega, \{1\}, \{2, 3, 4, 5\}\} \]

- \( A_1 = \{\text{Ming will go to school tomorrow}\}, P(A_1) = 0.8 \)
  
  \( A_2 = \{\text{Mary will go to school tomorrow}\}, P(A_2) = 0.9 \)
  
  \( A_3 = \{\text{Mike will go to school tomorrow}\}, P(A_3) = 0.8 \)

- Compare \( P(\text{at least 1 six in 4 rolls of one fair dice}), P(\text{at least 1 double sixes in 24 rolls of two fair dices}) \)

- Interpretation of infinite collection of sets

2. In answering a question on a multiple-choice test, a student either (correctly) knows the answer or guesses. Let \( p \) be the probability that the student guesses. Assume that a student will be correct with probability \( 1/m \), where \( m \) is the number of multiple-choice alternatives. What is the conditional probability that a student knew the answer, given that he or she answered it correctly?

3. There are 12 tennis balls in a box (9 news, 3 used). In the first match, 3 balls are selected at random and used in the game. After the game, these balls are returned to the box. Then in the second match, 3 balls are selected at random again.

(a) Find the probability that the 3 balls selected in the second match are all news.

(b) Given that the 3 balls selected in the second match are new, find the probability that the 3 balls selected in the first match are also all news.

4. Extra Excises:

1.18, 1.2, 1.6, 1.14, 1.16, 1.22, 1.23, 1.25