EdExcel Statistics 1

Probability

Section 2: Conditional Probability

Exercise

1. In a small sixth form of 60 students Maths and English are the two most popular subjects.

   - 24 students are studying Maths
   - 35 students are studying English
   - 15 students are studying Maths and English.

   Find the probability of a student studying English given they study Maths.

2. A satellite TV company, to research why people chose to subscribe, undertook 35 interviews.

   - Of the 15 men interviewed, 10 preferred sports to films.
   - 8 women preferred films to sports.

   Given that we randomly choose a person who prefers films, what is the probability that this person is a man?

3. The number of students selecting English and History is as follows:

	History	Not History	Total
English	9	21	30
Not English	6	14	20
Total	15	35	50

   Let E be the event that the student studies English.
   Let H be the event that the student studies History.
   Are E and H independent events?

4. A student regularly has to take two train journeys on a Sunday.
   Over a long period of time she has worked out the probability that the first train is late is 0.4.
   If the first train is late, the probability that the second train is late is 0.5.
   If the first train is not late, the probability that the second train is late is 0.3.

   Draw a tree diagram to show the possible outcomes for her next 2 journeys on a Sunday.

   Using the tree diagram calculate the probability:

(i) That exactly one journey is on time.

(ii) That, given the second journey is on time, that both trains were on time.

5. In the build up to the Olympics a high jumper measured her success at a particular height. She has a maximum of 3 attempts at this height; once she has jumped successfully she does not jump that height again.

On 60% of occasions she clears it at the first attempt.
Attempting the height for the second time, she is now successful in 75% of the attempts.
Attempting the height for the third time, she is now successful in only 30% of the attempts.

Draw a tree diagram to show the possible outcomes.

From the tree diagram calculate the probability:

(i) That she successfully clears the height in her three attempts.

(ii) That, given she clears the height, that she successfully does so at the first attempt.