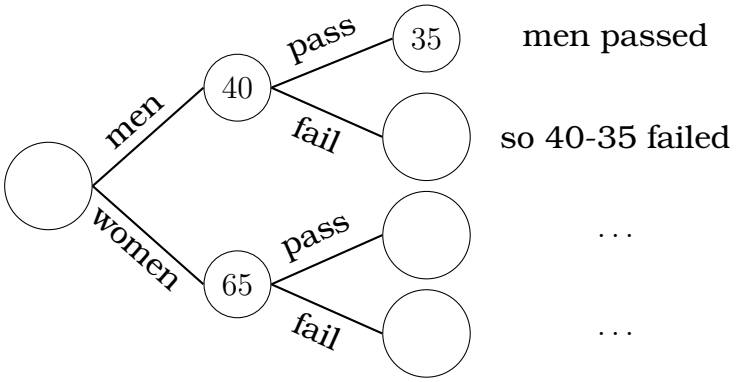
3.5 Lesson 5 Frequency trees and two way tables

A frequency tree or a two-way table can help us to sort information so that we can use how many items are in a particular group or combination of groups.

■ **Exemple 3.3** A group of 40 men and 65 women were asked wheter they have passed their English test. In total 85 people passed their English test including 35 men.
Complete the frequency tree and work out the probability that **a person in this group failed their English test**.



solution. $P(\text{a person fail}) = \dfrac{5+15}{105} =$ ■

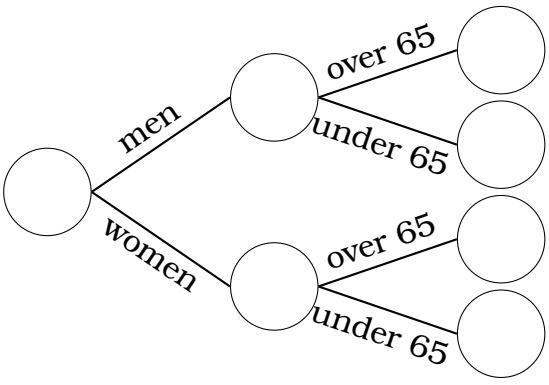
■ **Exemple 3.4** A group of 280 students had to choose whether to study French, German of Spanish. There were 150 girls and 82 girls chose French. 25 students chose German, 15 of whom were boys.
Complete the table and work out the **probability that a girl will chose spanish**.

	Girls	Boys	Total
French	82		
German		15	25
Spanish			
Total	150		280

solution. $P(\text{chose spanish among girls}) = \dfrac{58}{150}$. ■

Exercise 10 Answer the questions. Show your workings

1. The frequency tree shows some information about people who belong to a tennis club.
   There are 108 members of the tennis club, of which 74 are men. Of the men, 45 are over 65.
   There are also 23 women over the age of 65.
   Complete the frequency tree and work out :



   a) the probability that a member of the tennis club is a woman under 65.

   b) the probability that a man at this tennis club is over 65.

2. The table shows some information about how 200 people intended to vote. In total 82 people intended to vote Labour. 124 people over the age od 25 were asked and 75 of them intended to vote Conservative. Of the people under the age of 25, 60 intended to vote Labour and 12 said 'other'.

	Under 25	Over 25	Total
Conservative			
Labour			
Other			
Total			

Complete the two way table, and work out the following probabilities :

a) the probability that a person selected at random intended to vote Conservative.

b) the probability that a member of the tennis club is a woman under 65.

c) the probability that a person selected at random is under 25 and intended to vote Conservative.

d) the probability that a member of the tennis club is a woman under 65.

e) the probability that a person under the age of 25 intended to vote Conservative.

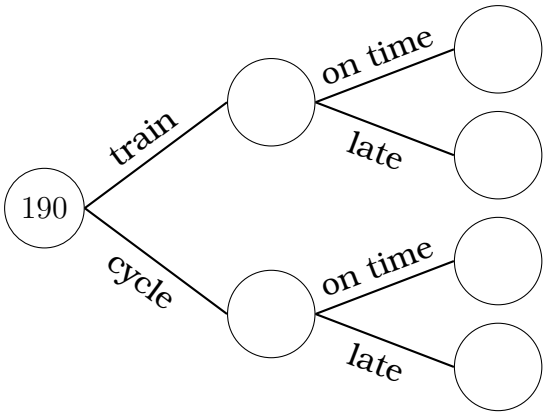
f) the probability that a member of the tennis club is a woman under 65.

g) the probability that a person who intends to vote Conservative is under the age of 25.

h) the probability that a member of the tennis club is a woman under 65.

3. The frequency tree shows some information about people arriving at work.

34 people who took a train were late to work. In total 56 people were late to work. 82 people cycle to work. Complete the frequency tree and work out the following probabilities :



a) the probability that a person selected at random takes the train to work and is on time

b) the probability that a person who cycles to work is late.

c) the probability that a person who is late to work arrived by train.

4. The table shows the favorite subjects ofa group of year 7 and 8 students.

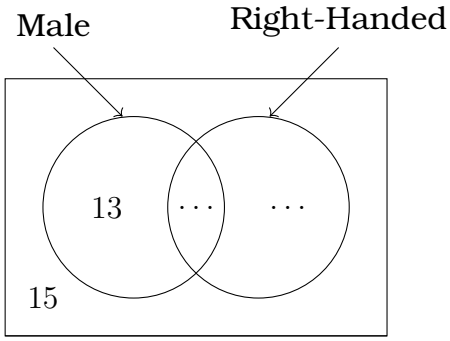
	Year 7	Year 8	Total
Maths	55	92	
Science			140
English	94		
Total		302	570

a) Complete the two way table.

b) Work out the probability that a student chosen at random is in the year 7 and their favorite subject is maths.

c) Work out the probability that a student in year 8 says their favorite subject is Science.

Exercise 11 — Multiple representations. The Venn diagram, two-way table and frequency tree all show the same information. Complete them all.



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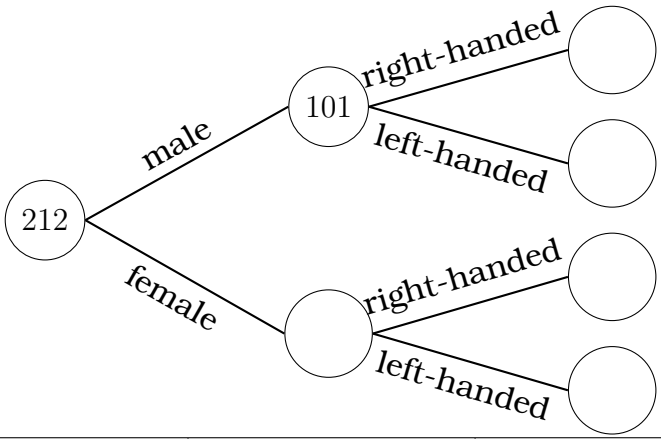

	Male	Female	Total
Right-Handed			
Left-Handed			
Total			