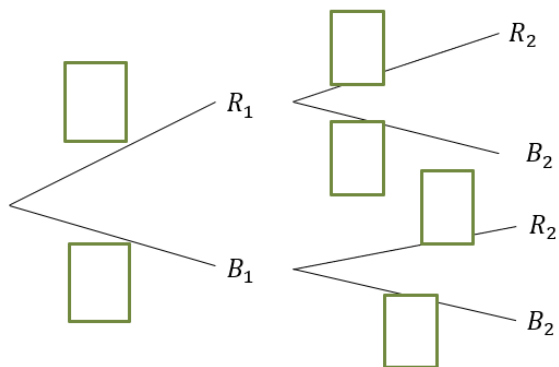


# Probability Trees

We saw probability trees in Year 1. The only difference here is **determining a conditional probability** using your tree.

**Example:** You have two bags, the first with 5 red balls and 5 blue balls, and the second with 3 red balls and 6 blue balls. You first pick a ball from the first bag, and place it in the second. You then pick a ball from the second bag. Complete the tree diagram.



Hence find the probability that:

a) You pick a red ball on your second pick.

b) Given that your second pick was red, the first pick was also red.

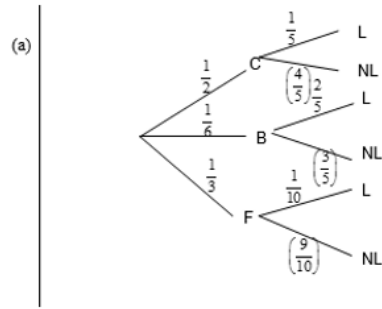
EXAMPLE

**Edexcel S1 May 2009 Q2**

On a randomly chosen day the probability that Bill travels to school by car, by bicycle or on foot is  $\frac{1}{2}$ ,  $\frac{1}{6}$  and  $\frac{1}{3}$  respectively. The probability of being late when using these methods of travel is  $\frac{1}{5}$ ,  $\frac{2}{5}$  and  $\frac{1}{10}$  respectively.

(c) Given that Bill is late, find the probability that he did not travel on foot. **(4)**

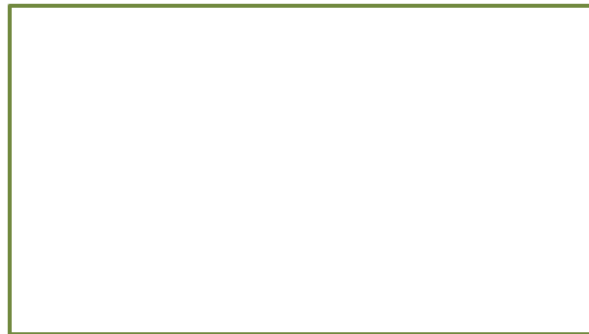
(Part (a) asks for a tree diagram, which may help with this question)



Correct tree  
All labels  
Probabilities  
on correct  
branches

B1  
B1

B1



## Testing Your Understanding

**Edexcel S1**

6. [Jan 2006 Q4] A bag contains 9 blue balls and 3 red balls. A ball is selected at random from the bag and its colour is recorded. The ball is not replaced. A second ball is selected at random and its colour is recorded.

(a) Draw a tree diagram to represent the information. **(3)**

Find the probability that

- (a) the second ball selected is red, **(2)**
- (b) both balls selected are red, given that the second ball selected is red. **(2)**

(a)

(b)

(c)

