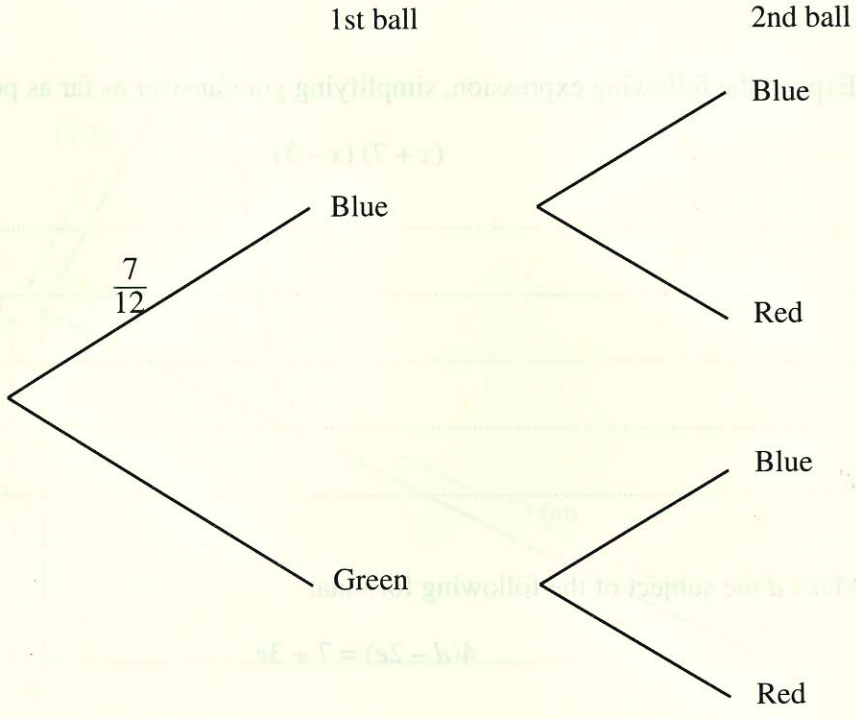
20. A bag contains 7 blue balls and 5 green balls. Another bag contains 4 blue balls and 6 red balls. A ball is drawn at random from the first bag and its colour is noted. A ball is then drawn at random from the second bag and its colour is noted.

(a) Complete the following tree diagram.



[2]

(b) Calculate the probability that both balls are blue.

.....

.....

[2]

(c) Calculate the probability that at least one ball is blue.

.....

.....

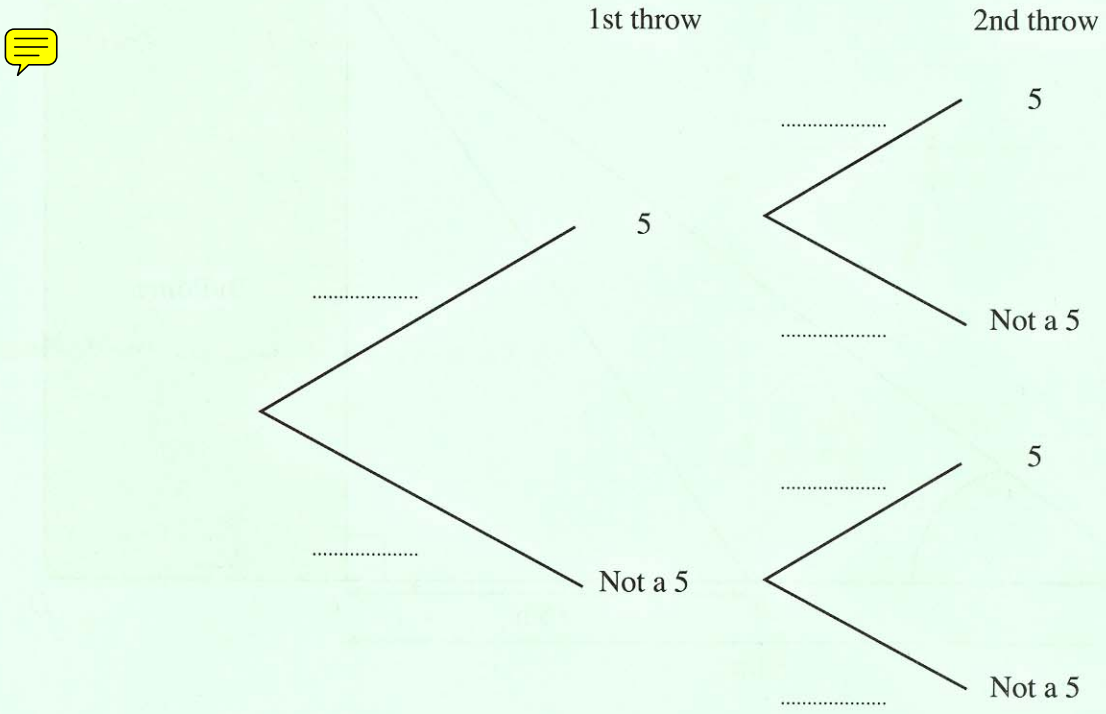
.....

.....

[2]

23. Carol has a fair 20-sided dice. Each face of the dice is labelled with one of the ten numbers 0 to 9 and each number is used twice. She throws the dice twice and each time she records whether or not the number is a 5.

(a) Complete the following tree diagram.



[2]

(b) Calculate the probability that, on 2 throws of the dice, Carol gets exactly one 5.

.....

.....

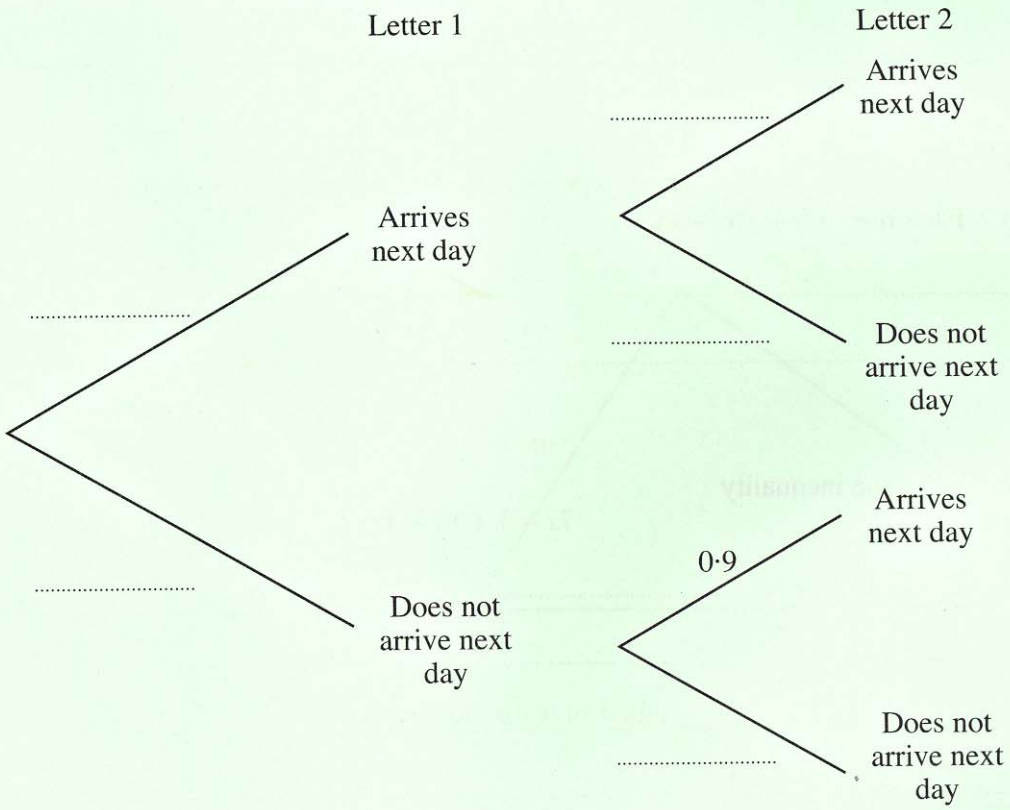
.....

.....

[2]

25. Suppose that 90% of first class letters posted before 3 pm on a Tuesday arrive at their destination on the next day.

(a) Complete the following tree diagram to show the probabilities of what can happen when two first class letters are posted independently before 3 pm on a Tuesday.



[2]

(b) Calculate the probability that exactly one of the first class letters arrives the next day.

.....

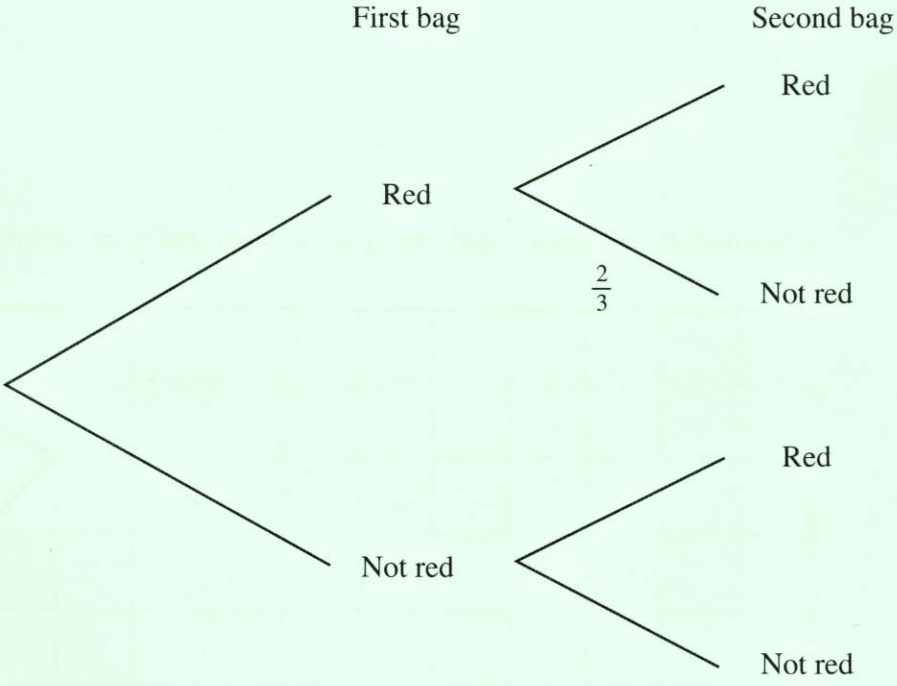
.....

.....

[2]

23. Two bags contain some coloured balls, which are identical except for their colour.
One ball is taken at random from each bag and their colours noted.
The probability of the selected ball from the first bag being red is $\frac{1}{4}$.
The probability of the selected ball from the second bag NOT being red is $\frac{2}{3}$.

(a) Complete the following tree diagram. [2]



(b) Calculate the probability that both balls are red.

.....

.....

[2]

(c) Calculate the probability that only one ball is red.

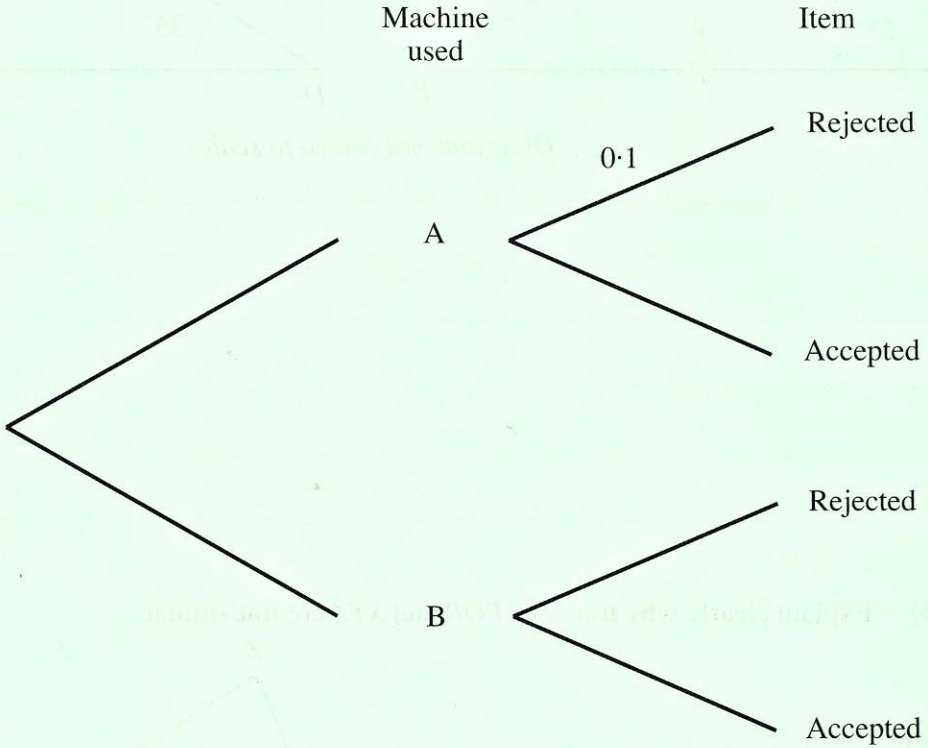
.....

.....

[3]

22. A factory has two machines, A and B, which it uses to make large numbers of a certain item. Machine A is used to make 60% of the factory's total output and Machine B is used for the remainder. The probability that an item made on Machine A is rejected is 0·1. The probability that an item made on Machine B is rejected is 0·2.

(a) Complete the following tree diagram.



[2]

(b) Calculate the probability that an item chosen at random is accepted.

.....

.....

.....

.....

[2]

15. One "lucky draw" machine contains 20 balls numbered 1 to 20 respectively.
Another machine contains 12 balls numbered 101 to 112 respectively.
Each machine selects one ball at random. Calculate the probability that one of the selected balls is numbered 10 and the other is numbered 110.

.....

.....

.....

.....

[3]