

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 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.

(b) Calculate the probability that both balls are blue.
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Calculate the probability that at least one ball is blue
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$\qquad$
$\qquad$
(2)

Vivienne has a fair cubical dice with its faces numbered from 1 to 6 and a biased dice for which the probability of throwing a 4 is $\frac{1}{3}$. She throws the two dice and notes whether or not a 4 is obtained on each dice.
(a) Complete the following tree diagram.

Fair dice
Biased dice

(b) Calculate the probability that both dice show 4 .
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(c) Calculate the probability that exactly one dice shows 4 .
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(3) Each lunchtime Paul either eats a packed lunch or he eats a sandwich bought in the snack bar. The probability that he eats a packed lunch is $\frac{3}{5}$. Whatever he eats for lunch the probability that he buys a mug of tea is $\frac{3}{10}$.
(a) Complete the following tree diagram.

(b) Calculate the probability that Paul eats a packed lunch and he buys a mug of tea.
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(4) 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.

First bag
Second bag

(b) Calculate the probability that both balls are red.
(c) Calculate the probability that only one ball is red.

A box contains coloured cubes identical except for their colour. The probability of choosing a red cube at random from the box is $\frac{5}{7}$. A bag also contains similar coloured cubes. The probability of choosing a red cube at random from the bag is $\frac{3}{5}$.
Chris takes a cube at random from the box and a cube at random from the bag.
(a) Complete the following tree diagram.

b) Calculate the probability that neither of the chosen cubes is red

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.

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