

More Combined Events

(a) In a bag there are 6 red, 4 black and 5 white counters. A counter is chosen at random from the bag, replaced and then another counter is chosen.



- Work out the probability of choosing a red counter twice.
- Work out the probability of choosing a black counter then a white counter.
- Work out the probability of choosing two counters, neither of which are red.

$$(i) \frac{6}{15} \times \frac{6}{15} = \frac{36}{225} = \frac{4}{25}$$

$$(ii) \frac{4}{15} \times \frac{5}{15} = \frac{20}{225} = \frac{4}{45}$$

$$(iii) \frac{9}{15} \times \frac{9}{15} = \frac{81}{225} = \frac{9}{25}$$

(b) Antoine has to sit exams in Biology, Chemistry and Physics. The probability of passing Biology is 0.8, of passing Chemistry is 0.6 and of passing Physics is 0.7. These are independent events.

- Calculate the probability that Antoine passes all three exams.
- Calculate the probability that Antoine passes Chemistry and Physics but not Biology.
- Calculate the probability the Antoine only passes Chemistry.

$$(i) 0.8 \times 0.6 \times 0.7 = 0.336$$

$$(ii) 0.6 \times 0.7 \times 0.2 = 0.084$$

$$(iii) 0.6 \times 0.2 \times 0.3 = 0.036$$

Letters spelling the word PROBABILITY are put into a bag. Roy chooses a letter at random from the bag, replaces the letter, then chooses a second letter.

P R O B A B I L I T Y

- Work out the probability that Roy chooses a letter B twice.
 - Find the probability that Roy chooses a letter P then a letter I.
 - Find the probability that Roy chooses a letter O followed by a letter which is not a vowel.
- Roy replaces the second letter and chooses a third letter.
- Calculate the probability that Roy spells his own name when choosing the three letters.
 - Calculate the probability that Roy chooses three vowels.
 - Calculate the probability that Roy chooses two consonants followed by the letter I.

$$(i) \frac{2}{11} \times \frac{2}{11} = \frac{4}{121}$$

$$(ii) \frac{1}{11} \times \frac{2}{11} = \frac{2}{121}$$

$$(iii) \frac{1}{11} \times \frac{7}{11} = \frac{7}{121}$$

$$(iv) \frac{1}{11} \times \frac{1}{11} \times \frac{1}{11} = \frac{1}{1331}$$

$$(v) \frac{4}{11} \times \frac{4}{11} \times \frac{4}{11} = \frac{64}{1331}$$

$$(vi) \frac{7}{11} \times \frac{7}{11} \times \frac{2}{11} = \frac{98}{1331}$$