

Independent events (the AND rule)

Starter

1. Without using a calculator, find:

(a) $\frac{6}{11} \times \frac{5}{11}$

(b) $\frac{4}{9} \times \frac{3}{5}$

(c) 0.6×0.4

(d) 0.7×0.1

Working: (a) $\frac{6 \times 5}{11 \times 11} = \frac{30}{121}$

(b) $\frac{4 \times 3}{9 \times 5} = \frac{4 \times 1}{3 \times 5} = \frac{4}{15}$ *cancel top and bottom where possible*

(c) Count the digits after the decimal point in the question (2) — the answer will have the same number of digits after the decimal point
So $0.6 \times 0.4 = 0.24$

(d) $0.7 \times 0.1 = 0.07$

E.g. 1 A bag contains 4 red, 7 blue and 9 green discs. A disc is removed, its colour noted, and then it is put back in the bag. A second disc is then chosen. Find the probability of getting:

- (a) a red and then a blue
- (b) two green discs
- (c) a blue and then not a blue
- (d) a red and a blue in any order

Working: (a) $P(R, B) = \frac{4}{20} \times \frac{7}{20} = \frac{7}{100}$

(b) $P(G, G) = \frac{9}{20} \times \frac{9}{20} = \frac{81}{400}$

(c) Not a blue \equiv red or green = $4 + 9 = 13$
 $P(B, B') = \frac{7}{20} \times \frac{13}{20} = \frac{91}{400}$

(d) $P(R, B) + P(B, R) = \frac{4}{20} \times \frac{7}{20} + \frac{7}{20} \times \frac{4}{20} = \frac{7}{50}$

E.g. 2 A coin is flipped 3 times. What is the probability of getting 3 heads?

Working: $P(H) = \frac{1}{2}$ so
 $P(H, H, H) = \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} = \frac{1}{8}$

E.g. 3 A card is removed from a pack. It is then replaced in the pack and a second card is chosen. Find the probability of getting:

- (a) a red card then a spade ♠
- (b) a 7 then a black card
- (c) a picture card then the 2 of hearts (2♥)

Working:

- (a) Half of the cards are red; one quarter of the cards are ♠

$$P(\text{red, spade}) = \frac{1}{2} \times \frac{1}{4} = \frac{1}{8}$$

- (b) There are four 7s in a pack; half of the cards are black.

$$P(\text{a 7, black}) = \frac{4}{52} \times \frac{1}{2} = \frac{1}{26}$$

- (c) There are 12 picture cards in a pack (3 in each suit - KQJ); there is only one 2♥ in a pack

$$P(\text{a picture card, the 2 of hearts}) = \frac{12}{52} \times \frac{1}{52} = \frac{3}{676}$$

Video: [Independent events](#)

[Solutions to Starter and E.g.s](#)

Exercise

9-1 class textbook:

p248 M8.8 Qu 1-12

A*-G class textbook:

p213 M8.6 Qu 1-12

9-1 homework book:

p85 M8.8 Qu 1-8

A*-G homework book:

p61 M8.6 Qu 1-8

[Homework book answers \(only available during a lockdown\)](#)