

Probability – Independent Events – AND/OR Rule – www.m4ths.com

(1) Jim is playing a game of darts and a game of pool. $P(\text{win darts}) = 0.3$ and $P(\text{win pool}) = 0.54$. The two events are independent.

- (a) Draw a tree diagram to show the outcomes.
- (b) Show that the probability of Jim winning both games is 0.162
- (c) Show that the probability of him winning EXACTLY one game is 0.516.
- (d) Show that the probability of winning AT LEAST one game is 0.678.

(2) Bonib is playing 2 different games. In the first game the probability of him getting the answer right is $\frac{2}{7}$. In the second game the probability of him getting the answer right is $\frac{3}{11}$. The games are independent.

- (a) Draw a tree diagram to show the outcomes.
- (b) Find the probability of him getting the answer wrong in both games.
- (c) Show the probability of him getting only one answer right is $\frac{31}{77}$.

(3) There are 12 counters in a bag. 7 are black and the rest are red. John picks a counter at random, notes its colour and replaces it. He repeats this once.

- (a) Draw a tree diagram to show the outcomes.
- (b) Find the probability that he picks 2 of the same colour.

(4) Fred and Laura play each other once at darts and once at pool. The probability of Fred winning at darts is 0.7 and the probability of Laura winning at pool is 0.6. The two events are independent.

- (a) Draw a tree diagram to represent the information.
- (b) Find the probability that Fred wins both games.
- (c) Find the probability of Laura winning at least one game.

(5) Julie travels to and from school. The probability of her walking to school is 0.32. The probability that she walks home is 0.42. The two events are independent.

- (a) Find the probability that she walks to school every day for a week (Monday to Friday).
- (b) Find the maximum value of the probability that on a Tuesday she bikes to school and catches the bus home.

(6) John has a fair 6-sided dice and every letter from the alphabet on a card. He rolls the dice and picks a card. What is the probability that he gets an even number on the dice and a vowel on the card?

(7) Janet picks a day of the week and a month of the year. Fred has to guess the combination she has chosen. What is the probability that he gets it right?

(8) Mike flips a fair coin 5 times in a row. Find the probability of him getting 5 heads. Give your answer as a fraction.

(9) Wasim has the choice of 8 different drinks, 4 different snacks and 6 different main meals. Colin tries to guess which choices Wasim chose. What is the probability that Colin gets it right?

(10)* Fred is playing two games. The games are game A and game B. The outcomes of the games are independent. $P(\text{win game A}) = 0.6$ and $P(\text{win both game A and B}) = 0.48$. Find $P(\text{lose both games.})$

(11)* Jenny is flipping a fair coin. $P(A) = \frac{1}{64}$. Explain clearly what A could represent.

(12)* There are 10 counters in a bag. N are black and the rest are white. Nobib picks a counter, notes its colour and replaces it. Find simplified expressions for the probability of each giving your answers in terms of N .

- (a) Both counters are black
- (b) Both counters are white
- (c) The counters were different colours.
- (d) At least one counter is black.

Given that $P(2 \text{ Blacks}) = 0.09$

- (e)** Show that $N^2 = 9$