



Aberdare Community School
Mathematics Department

WJEC GCSE
Higher – Non Calculator
Data

Probability - AND and OR rules

Name:

Set:

Date:

Teacher:

23. A box contains 11 cartons of fruit juice. There are 5 cartons of lime juice, 4 cartons of blackcurrant juice and 2 cartons of raspberry juice.
Two cartons are selected at random from the box.

(a) Calculate the probability that both selected cartons contain lime juice.

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(b) Calculate the probability that neither of the cartons contains blackcurrant juice.

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21. A bag contains 20 marbles. There are 13 yellow, 6 green and 1 red marbles in the bag. Two marbles are selected at random from the bag.

(a) Calculate the probability that both the selected marbles are green.

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(b) Calculate the probability that at least one of the selected marbles is yellow.

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24. A box contains 2 strawberry yogurts, 4 vanilla yogurts and 6 cherry yogurts.
Three yogurts are selected at random from the box.
Calculate the probability that at least one of the selected yogurts is a cherry yogurt.

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15. A bag contains 7 yellow beads, 3 white beads and 1 black bead. Two beads are drawn at random without replacement from the bag.

(a) Calculate the probability that the two beads are both yellow.

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(b) Calculate the probability that at least one white bead is drawn.

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20. A bag contains 20 beads. There are 3 green, 4 yellow and 13 red beads in the bag. Two beads are selected at random without replacement from the bag.

(a) Calculate the probability that both selected beads are yellow.

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(b) Calculate the probability that the two beads are different colours.

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22. A box contains 11 cartons of fruit juice. There are 5 cartons of lime juice, 4 cartons of blackcurrant juice and 2 cartons of raspberry juice.

Two cartons are selected at random from the box.

(a) Calculate the probability that both selected cartons contain lime juice.

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(b) Calculate the probability that neither of the cartons contains blackcurrant juice.

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13. Robbie sits a multiple choice examination.

For each question in the examination, four possible answers are given, only one of these answers is correct.

Robbie knows 80% of the facts tested in the examination and for each question based on these facts he selects the correct answer.

On all other questions he selects at random one of the four possible answers.

(a) A question is selected at random from the paper.
Calculate the probability that Robbie correctly answers the question.

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(b) The examination has 40 questions.
Calculate how many questions you might expect Robbie to answer correctly.

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16.



Five cards are numbered 2, 3, 4, 5, 6 respectively.
The cards are shuffled and two cards are chosen at random.

(a) Calculate the probability that the numbers on the chosen cards are both even.

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(b) Calculate the probability that the product of the numbers on the chosen cards is odd.

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(c) Calculate the probability that at least one even card is selected.

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14. A bag contains 11 marbles.
There are 3 yellow, 3 blue and 5 red marbles in the bag.
Two marbles are selected at random from the bag.

(a) Calculate the probability that both the selected marbles are blue.

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(b) Calculate the probability that exactly one of the selected marbles is red.

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15.



Five cards are numbered 2, 3, 5, 7, 11 respectively.
The cards are shuffled and two cards are chosen at random.

(a) Calculate the probability that at least one of the numbers is odd.

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(b) Calculate the probability that the **sum** of the numbers on the chosen cards is odd.

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(c) Calculate the probability that the **product** of the numbers on the chosen cards is odd.

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15. A bag contains 11 beads, 6 of which are yellow, 3 are white and 2 are black. Two beads are drawn at random, without replacement, from the bag. Calculate the probability that at least one white bead is drawn.

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- 14.** One hundred raffle tickets are sold.
The tickets sold are numbered from 1 to 100.
The raffle tickets are placed in a drum.
Two raffle tickets are selected at random, one ticket at a time, and not replaced in the drum.

(a) Find the probability that one of the tickets drawn is even and the other is odd.

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(b) Find the probability that at least one of the tickets drawn is even.

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12. A box contains 20 marbles, of which 2 are red, 3 are yellow and 15 are black. Two marbles are selected at random, without replacement, from the box. What is the probability that exactly one of the marbles is black?

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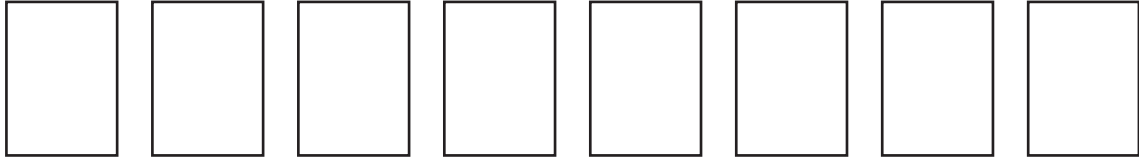
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15. Each of eight cards has one factor of 70 on it.
The eight numbers are all different.



Two cards are selected at random without replacement.

- (a) Calculate the probability that the **difference** of the two numbers on the selected cards is odd.

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- (b) Calculate the probability that at least one of the selected cards is even.

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16. Maisy is given a multiple-choice test during a job interview.
There are five possible choices given for each question but only one is the correct answer.
Maisy knows the correct answers to 60% of the questions in the test.
For all the other questions Maisy selects an answer at random.

(a) A question is selected at random from the test.
Calculate the probability that Maisy answers this question correctly.

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(b) The test has 200 questions.
Calculate how many questions you might expect Maisy to answer correctly.

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END OF PAPER

13. A bowl contains 25 beans.
There are 6 kidney beans, 9 pinto beans and 10 black-eyed beans.
Two beans are selected at random from the bowl, without replacement.

(a) Calculate the probability that both of the beans are black-eyed beans.

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(b) Calculate the probability that at least one pinto bean is selected.

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END OF PAPER



11. A bag contains 21 raffle tickets, 16 of which are white, 4 are yellow and 1 is purple. Two raffle tickets are drawn at random without replacement from the bag. Calculate the probability that at least one white raffle ticket is drawn. You **must** give your answer as a fraction in its simplest form.

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END OF PAPER

18. Rhodri has four pairs of shoes.
The colours of the pairs of shoes are red, purple, black and white.
The shoes are kept in a trunk in a dark room.
Rhodri selects two shoes at random.

Calculate the probability that Rhodri selects

- (a) two shoes, neither of which is purple, [3]

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- (b) a matching pair of shoes. [4]

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END OF PAPER

15. At a children's party, the winner of each game picks a sweet at random out of a box. At the start of the party, the box contains 6 strawberry sweets, 3 lemon sweets and 1 blackcurrant sweet.

Assuming that no child returns a sweet to the box, find the probability that

(a) the winners of the first two games pick sweets of the same flavour, [3]

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(b) the blackcurrant sweet is still in the box **after** the winners of the first three games have picked their sweets. [2]

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END OF PAPER

15. A bag contains four red counters and four yellow counters.
Three counters are picked from the bag at random, **without** being replaced.

Find the probability that the three counters picked are of the same colour.

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19. Ralph does not like strawberry flavoured chocolates.
In a dark cinema during a film, Ralph selects two chocolates at random from a box.
There are 20 chocolates in the box.
Of these chocolates, 5 are strawberry flavoured.
Calculate the probability that at least one of the chocolates that Ralph selects is strawberry flavoured. [4]

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END OF PAPER



15. Each of the numbers 1, 3, 5, 5, 5, 6, 7, 8 is written on a card.



Two of the eight cards are selected at random, without being replaced.

Find the probability that

(a) the product of the numbers on the two cards selected is 25, [2]

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(b) the sum of the numbers on the two cards selected is less than 15. [3]

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14. A box contains 5 red balls, 1 green ball and 6 pink balls.
Two balls are to be picked at random, without replacement.

(a) Find the probability of picking 1 red ball and 1 green ball.

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(b) Find the probability of picking at least one red ball.

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