

Name:
Group D
Result:

1.

[4 *points*]

In a group of 44 students, 20 students study Economics and 11 students study History. 15 students study neither Economics nor History.

- a) How many students study both Economics and History?
- b) A student is chosen at random. Find the probability that this student:
 - i) study exactly one of the two subjects,
 - ii) study Economics, given that she does **not** study History.
- c) Two students are selected at random. Find the probability that both study Economics **only**.

2.[2 *points*]

Two events A and B are such that $P(A) = \frac{9}{16}$ and $P(B) = \frac{3}{8}$ and $P(A|B) = \frac{1}{4}$. Calculate the probability that:

- a) both events will happen,
- b) neither event will happen,

3.[3 *points*]

Two standard dice are thrown. What is the probability that:

- a) the sum of the scores is greater than 8,
- b) at least one die shows a three,
- c) at least one die shows a three, given that the sum of the scores is greater than 8.

4.

[2 points]

There are 4 IB teachers at Batory. One of them will be randomly chosen to write the preIB year 2 test. If Tomasz is chosen, the probability that the test is very hard is 80%. If any of the other teachers is chosen, the probability that the test is very hard is 50%. The test turns out to be very hard. Find the probability that Tomasz wrote the test.

5.

[2 points]

There are seven balls in a box: 3 red and 4 blue. A ball is picked, its colour noted and then the ball is returned to the box. This process is then repeated several times.

- a) Find the probability that the first red ball is picked in the second try.
- b) Find the probability that in the first three tries at least one red ball is picked.

6.

[2 points]

A and B are independent events with $P(A) = 0.2$ and $P(A \cup B) = 0.44$.

- a) Find $P(B)$.
- b) Show that A and B are not mutually exclusive.

7.

[5 points]

A box contains 12 balls of which n are yellow and the rest are blue. Two balls are picked. The probability that they are of different colour is $\frac{35}{66}$.

- a) Find n , given that there are more yellow balls than blue balls.
- b) If two balls were picked and they were of the same colour, what is the probability that they were both yellow?
- c) If three balls are picked, find the probability that at least one is blue.