

Mathematics Part A

DATE: 24 May 2022

Duration of the examination:

45 minutes

Total: 35 Points

- Exam without calculator
- The use of a formula sheet is allowed.



Part A	
Question 1	
<p>Calculate:</p> <p>a) $\binom{5}{3} =$</p> <p>b) $\binom{201}{1} =$</p>	<p>1 point</p> <p>1 point</p>
Question 2	
<p>The PIN code of a bank card consists of 5 digits.</p> <p>a) How many different PINs can you create?</p> <p>b) Lisa has a PIN code that consists of 5 digits. Unfortunately, she forgot her PIN. She remembers that her PIN code begins with the number 418 and she also remembers that the numbers 0 and 9 do not appear in her PIN code. How many PIN codes are still possible?</p>	<p>3 points</p> <p>4 points</p>
Question 3	
<p>A class consists of 6 Flemish and 3 Dutch pupils. In this class we select a team of 3 students for the student council.</p> <p>a) How many different teams of 3 students can be formed?</p> <p>b) How many different teams of 3 students can be formed if each team has at least 1 Flemish and 1 Dutch representative.</p>	<p>3 points</p> <p>3 points</p>

Question 4

The probability distribution of a stochastic variable X is given.

x	0	1	2	3	4
$P(X = x)$	$\frac{1}{10}$	$\frac{1}{5}$	$\frac{2}{5}$	$\frac{1}{5}$	$\frac{1}{10}$

- a) Explain why this table is a probability distribution.
- b) Calculate the expected value of X .
- c) Calculate $P(X > 2)$
- d) Calculate $P(X < 4)$

2 points
2 points
2 points
2 points

Question 5

In an ice cream parlor you can choose from 2 flavors of ice cream: chocolate or vanilla. A combination of flavors is not allowed. You can get the ice cream in a cone or a cup.

In this ice cream parlor, 50% of the customers choose a cone and 50% opt for a cup.

35% of customers choose a cup with chocolate ice cream.

20% of customers take vanilla ice cream.

- a) A new customer enters the ice cream parlor. Calculate the probability that the customer chooses a cone with vanilla ice cream.
- b) The next customer chooses vanilla ice cream. Calculate the probability that this customer wants a cone.
- c) Are the events "choosing a cone" and "choosing chocolate ice cream" independent events. Explain your answer.

4 points
4 points
4 points