+1/1/60+

EPFL

Teacher : **TEACHER**
EXAM - MA
DATE
DURATION

AC-345

Student 1

SCIPER : **999000** Room : **R-A** Signature :

Do not turn the page before the start of the exam. This document is double-sided, has 4 pages, the last ones possibly blank. Do not unstaple.

- Place your student card on your table.
- **No other paper materials** are allowed to be used during the exam.
- Using a **calculator** or any electronic device is not permitted during the exam.
- For the **multiple choice** questions, we give :
  +3 points if your answer is correct,
  0 points if you give no answer or more than one,
  −1 points if your answer is incorrect.
- For the **true/false** questions, we give :
  +1 points if your answer is correct,
  0 points if you give no answer or more than one,
  −1 points if your answer is incorrect.
- Use a **black or dark blue ballpen** and clearly erase with **correction fluid** if necessary.
- If a question is wrong, the teacher may decide to nullify it.

Respectez les consignes suivantes | Observe this guidelines | Beachten Sie bitte die unten stehenden Richtlinien

choisir une réponse | select an answer
Antwort auswählen

ne PAS choisir une réponse | NOT select an answer
NICHT Antwort auswählen

Corriger une réponse | Correct an answer
Antwort korrigieren

ce qu'il ne faut **PAS** faire | what should **NOT** be done | was man **NICHT** tun sollte

First part: multiple choice questions

For each question, mark the box corresponding to the correct answer. Each question has **exactly one** correct answer.

Question statement with several possible correct answers

- [x] False Answer Choice
- [ ] False Answer Choice
- [ ] Other Correct Answer Choice
- [x] Correct Answer Choice
- [ ] False Answer Choice

Question statement with several possible correct answers

- [ ] Other Correct Answer Choice
- [x] Correct Answer Choice
- [x] False Answer Choice
- [ ] False Answer Choice
- [ ] False Answer Choice

Let the subset $E \subset \mathbb{R}$ defined by $E = \left\{ 2\left(1+\frac{1}{n}\right)^n : n \in \mathbb{N} \setminus \{0\} \right\}$.

Then

- [ ] the minimum of E is 2
- [x] 10 is a majorant of E
- [ ] E is closed
- [ ] the supremum of E belongs to E

Question statement with one possible correct answer

- [x] Correct Answer Choice
- [ ] False Answer Choice
- [ ] False Answer Choice
- [ ] False Answer Choice

First part: multiple choice questions

For each question, mark the box corresponding to the correct answer. Each question has **exactly one** correct answer.

Let A be a bounded and non empty subset of $\mathbb{R}$.
Then $\inf A \in A$ and $\sup A \in A$.

☒ TRUE ☒ FALSE

Let $f\colon \mathbb{R} \to \mathbb{R}$ and $g\colon \mathbb{R} \to \mathbb{R}$ are two functions defined on all $\mathbb{R}$. If $f \circ g$ is injective, then g is injective.

☐ TRUE ☒ FALSE

Third part, open questions

Answer in the empty space below. Your answer should be carefully justified, and all the steps of your argument should be discussed in details. Leave the check-boxes empty, they are used for the grading.

Question 6: *This question is worth 8 points.*

☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 ☐8

We remind you that ...
Determine ...

Answer

Answer

Question 7: *This question is worth 2 points.*

☐0 ☐.5 ☐1 ☐.5 ☐2

We remind you that ...
Determine ...

Answer

+2/1/53+

EPFL

Teacher : **TEACHER**
EXAM - MT
DATE
DURATION

A-2

Student 2

SCIPER : **999001** Room : **R-A** Signature :

Do not turn the page before the start of the exam. This document is double-sided, has 4 pages, the last ones possibly blank. Do not unstaple.

- Place your student card on your table.
- **No other paper materials** are allowed to be used during the exam.
- Using a **calculator** or any electronic device is not permitted during the exam.
- For the **multiple choice** questions, we give :
  +3 points if your answer is correct,
  0 points if you give no answer or more than one,
  −1 points if your answer is incorrect.
- For the **true/false** questions, we give :
  +1 points if your answer is correct,
  0 points if you give no answer or more than one,
  −1 points if your answer is incorrect.
- Use a **black or dark blue ballpen** and clearly erase with **correction fluid** if necessary.
- If a question is wrong, the teacher may decide to nullify it.

Respectez les consignes suivantes | Observe this guidelines | Beachten Sie bitte die unten stehenden Richtlinien

choisir une réponse | select an answer
Antwort auswählen

ne PAS choisir une réponse | NOT select an answer
NICHT Antwort auswählen

Corriger une réponse | Correct an answer
Antwort korrigieren

ce qu'il ne faut **PAS** faire | what should **NOT** be done | was man **NICHT** tun sollte

First part: multiple choice questions

For each question, mark the box corresponding to the correct answer. Each question has **exactly one** correct answer.

Question statement with several possible correct answers

- ☐ False Answer Choice
- ☐ False Answer Choice
- ☒ Correct Answer Choice
- ☒ Other Correct Answer Choice
- ☐ False Answer Choice

Let the subset $E \subset \mathbb{R}$ defined by $E = \left\{ 2\left(1+\frac{1}{n}\right)^n : n \in \mathbb{N} \setminus \{0\} \right\}$.

Then

- ☐ E is closed
- ☐ the minimum of E is 2
- ☐ 10 is a majorant of E
- ☒ the supremum of E belongs to E

Question statement with several possible correct answers

- ☒ Correct Answer Choice
- ☐ False Answer Choice
- ☐ False Answer Choice
- ☐ False Answer Choice
- ☒ Other Correct Answer Choice

Question statement with one possible correct answer

- ☐ False Answer Choice
- ☐ False Answer Choice
- ☐ False Answer Choice
- ☒ Correct Answer Choice

First part: multiple choice questions

For each question, mark the box corresponding to the correct answer. Each question has **exactly one** correct answer.

Let A be a bounded and non empty subset of $\mathbb{R}$.
Then $\inf A \in A$ and $\sup A \in A$.

☒ TRUE ☐ FALSE

Let $f\colon \mathbb{R} \to \mathbb{R}$ and $g\colon \mathbb{R} \to \mathbb{R}$ are two functions defined on all $\mathbb{R}$. If $f \circ g$ is injective, then g is injective.

☒ TRUE ☐ FALSE

Third part, open questions

Answer in the empty space below. Your answer should be carefully justified, and all the steps of your argument should be discussed in details. Leave the check-boxes empty, they are used for the grading.

Question 6: *This question is worth 8 points.*

☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 ☐8

We remind you that ...
Determine ...

Question 7: *This question is worth 2 points.*

$\square_{0}$ $\square_{.5}$ $\square_{1}$ $\square_{.5}$ $\square_{2}$

We remind you that ...
Determine ...

+3/1/46+

EPFL

Teacher : **TEACHER**
EXAM - SV
DATE
DURATION

A-3

Student 3

SCIPER : **999002** Room : **R-A** Signature :

Do not turn the page before the start of the exam. This document is double-sided, has 4 pages, the last ones possibly blank. Do not unstaple.

- Place your student card on your table.
- **No other paper materials** are allowed to be used during the exam.
- Using a **calculator** or any electronic device is not permitted during the exam.
- For the **multiple choice** questions, we give :
  +3 points if your answer is correct,
  0 points if you give no answer or more than one,
  −1 points if your answer is incorrect.
- For the **true/false** questions, we give :
  +1 points if your answer is correct,
  0 points if you give no answer or more than one,
  −1 points if your answer is incorrect.
- Use a **black or dark blue ballpen** and clearly erase with **correction fluid** if necessary.
- If a question is wrong, the teacher may decide to nullify it.

Respectez les consignes suivantes | Observe this guidelines | Beachten Sie bitte die unten stehenden Richtlinien

choisir une réponse | select an answer Antwort auswählen	ne PAS choisir une réponse | NOT select an answer NICHT Antwort auswählen	Corriger une réponse | Correct an answer Antwort korrigieren

ce qu'il ne faut **PAS** faire | what should **NOT** be done | was man **NICHT** tun sollte

First part: multiple choice questions

For each question, mark the box corresponding to the correct answer. Each question has **exactly one** correct answer.

Question statement with one possible correct answer

- ☐ Correct Answer Choice
- ☒ False Answer Choice
- ☒ False Answer Choice
- ☐ False Answer Choice

Question statement with several possible correct answers

- ☐ False Answer Choice
- ☐ False Answer Choice
- ☒ Correct Answer Choice
- ☒ False Answer Choice
- ☐ Other Correct Answer Choice

Let the subset $E \subset \mathbb{R}$ defined by $E = \left\{ 2\left(1+\frac{1}{n}\right)^n : n \in \mathbb{N} \setminus \{0\} \right\}$.

Then

- ☐ the supremum of E belongs to E
- ☐ the minimum of E is 2
- ☒ E is closed
- ☐ 10 is a majorant of E

Question statement with several possible correct answers

- ☐ False Answer Choice
- ☒ False Answer Choice
- ☒ Correct Answer Choice
- ☐ False Answer Choice
- ☐ Other Correct Answer Choice

First part: multiple choice questions

For each question, mark the box corresponding to the correct answer. Each question has **exactly one** correct answer.

Let A be a bounded and non empty subset of $\mathbb{R}$.
Then $\inf A \in A$ and $\sup A \in A$.

☐ TRUE ☒ FALSE

Let $f\colon \mathbb{R} \to \mathbb{R}$ and $g\colon \mathbb{R} \to \mathbb{R}$ are two functions defined on all $\mathbb{R}$. If $f \circ g$ is injective, then g is injective.

☐ TRUE ☒ FALSE

Third part, open questions

Answer in the empty space below. Your answer should be carefully justified, and all the steps of your argument should be discussed in details. Leave the check-boxes empty, they are used for the grading.

Question 6: *This question is worth 8 points.*

☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 ☐8

We remind you that ...
Determine ...

Question 7: *This question is worth 2 points.*

☐0 ☐.5 ☐1 ☐.5 ☐2

We remind you that ...
Determine ...

+4/1/39+

EPFL

Teacher : **TEACHER**
EXAM - -
DATE
DURATION

B-1

Student 4

SCIPER : **999003** Room : **R-B** Signature :

Do not turn the page before the start of the exam. This document is double-sided, has 4 pages, the last ones possibly blank. Do not unstaple.

- Place your student card on your table.
- **No other paper materials** are allowed to be used during the exam.
- Using a **calculator** or any electronic device is not permitted during the exam.
- For the **multiple choice** questions, we give :
  +3 points if your answer is correct,
  0 points if you give no answer or more than one,
  −1 points if your answer is incorrect.
- For the **true/false** questions, we give :
  +1 points if your answer is correct,
  0 points if you give no answer or more than one,
  −1 points if your answer is incorrect.
- Use a **black or dark blue ballpen** and clearly erase with **correction fluid** if necessary.
- If a question is wrong, the teacher may decide to nullify it.

Respectez les consignes suivantes | Observe this guidelines | Beachten Sie bitte die unten stehenden Richtlinien

choisir une réponse | select an answer Antwort auswählen	ne PAS choisir une réponse | NOT select an answer NICHT Antwort auswählen	Corriger une réponse | Correct an answer Antwort korrigieren

ce qu'il ne faut **PAS** faire | what should **NOT** be done | was man **NICHT** tun sollte

First part: multiple choice questions

For each question, mark the box corresponding to the correct answer. Each question has **exactly one** correct answer.

Question statement with several possible correct answers

- [x] False Answer Choice
- [x] Correct Answer Choice
- [ ] False Answer Choice
- [ ] False Answer Choice
- [ ] Other Correct Answer Choice

Let the subset $E \subset \mathbb{R}$ defined by $E = \left\{ 2\left(1+\frac{1}{n}\right)^n : n \in \mathbb{N} \setminus \{0\} \right\}$.

Then

- [ ] 10 is a majorant of E
- [x] the minimum of E is 2
- [ ] the supremum of E belongs to E
- [ ] E is closed

Question statement with several possible correct answers

- [x] False Answer Choice
- [ ] Correct Answer Choice
- [ ] False Answer Choice
- [ ] False Answer Choice
- [x] Other Correct Answer Choice

Question statement with one possible correct answer

- [ ] Correct Answer Choice
- [ ] False Answer Choice
- [x] False Answer Choice
- [ ] False Answer Choice

First part: multiple choice questions

For each question, mark the box corresponding to the correct answer. Each question has **exactly one** correct answer.

Let A be a bounded and non empty subset of $\mathbb{R}$.
Then $\inf A \in A$ and $\sup A \in A$.

☐ TRUE ☒ FALSE

Let $f\colon \mathbb{R} \to \mathbb{R}$ and $g\colon \mathbb{R} \to \mathbb{R}$ are two functions defined on all $\mathbb{R}$. If $f \circ g$ is injective, then g is injective.

☒ TRUE ☐ FALSE

Third part, open questions

Answer in the empty space below. Your answer should be carefully justified, and all the steps of your argument should be discussed in details. Leave the check-boxes empty, they are used for the grading.

Question 6: *This question is worth 8 points.*

☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 ☐8

We remind you that ...
Determine ...

Question 7: *This question is worth 2 points.*

☐0 ☐.5 ☐1 ☐.5 ☐2

We remind you that ...
Determine ...

+5/1/32+

EPFL

Teacher : **TEACHER**
EXAM - -
DATE
DURATION

B-2

Student 5

SCIPER : **999004** Room : **R-B** Signature :

Do not turn the page before the start of the exam. This document is double-sided, has 4 pages, the last ones possibly blank. Do not unstaple.

- Place your student card on your table.
- **No other paper materials** are allowed to be used during the exam.
- Using a **calculator** or any electronic device is not permitted during the exam.
- For the **multiple choice** questions, we give :
  +3 points if your answer is correct,
  0 points if you give no answer or more than one,
  −1 points if your answer is incorrect.
- For the **true/false** questions, we give :
  +1 points if your answer is correct,
  0 points if you give no answer or more than one,
  −1 points if your answer is incorrect.
- Use a **black or dark blue ballpen** and clearly erase with **correction fluid** if necessary.
- If a question is wrong, the teacher may decide to nullify it.

Respectez les consignes suivantes | Observe this guidelines | Beachten Sie bitte die unten stehenden Richtlinien

choisir une réponse | select an answer
Antwort auswählen

ne PAS choisir une réponse | NOT select an answer
NICHT Antwort auswählen

Corriger une réponse | Correct an answer
Antwort korrigieren

ce qu'il ne faut **PAS** faire | what should **NOT** be done | was man **NICHT** tun sollte

First part: multiple choice questions

For each question, mark the box corresponding to the correct answer. Each question has **exactly one** correct answer.

Question statement with several possible correct answers

- ☐ Correct Answer Choice
- ☐ Other Correct Answer Choice
- ☒ False Answer Choice
- ☐ False Answer Choice
- ☒ False Answer Choice

Question statement with one possible correct answer

- ☐ False Answer Choice
- ☒ Correct Answer Choice
- ☐ False Answer Choice
- ☐ False Answer Choice

Let the subset $E \subset \mathbb{R}$ defined by $E = \left\{ 2\left(1+\frac{1}{n}\right)^n : n \in \mathbb{N} \setminus \{0\} \right\}$.

Then

- ☒ the supremum of E belongs to E
- ☐ the minimum of E is 2
- ☐ E is closed
- ☐ 10 is a majorant of E

Question statement with several possible correct answers

- ☐ False Answer Choice
- ☒ False Answer Choice
- ☒ Other Correct Answer Choice
- ☐ False Answer Choice
- ☐ Correct Answer Choice

First part: multiple choice questions

For each question, mark the box corresponding to the correct answer. Each question has **exactly one** correct answer.

Let A be a bounded and non empty subset of $\mathbb{R}$.
Then $\inf A \in A$ and $\sup A \in A$.

☒ TRUE ☐ FALSE

Let $f\colon \mathbb{R} \to \mathbb{R}$ and $g\colon \mathbb{R} \to \mathbb{R}$ are two functions defined on all $\mathbb{R}$. If $f \circ g$ is injective, then g is injective.

☐ TRUE ☒ FALSE

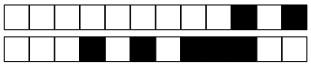
Third part, open questions

Answer in the empty space below. Your answer should be carefully justified, and all the steps of your argument should be discussed in details. Leave the check-boxes empty, they are used for the grading.

Question 6: *This question is worth 8 points.*

☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 ☐8

We remind you that ...
Determine ...



Question 7: *This question is worth 2 points.*

☐0 ☐.5 ☐1 ☐.5 ☐2

We remind you that ...
Determine ...

+6/1/25+

EPFL

Teacher : **TEACHER**
EXAM - MA
DATE
DURATION

B-3

Student 6

SCIPER : **999005** Room : **R-B** Signature :

Do not turn the page before the start of the exam. This document is double-sided, has 4 pages, the last ones possibly blank. Do not unstaple.

- Place your student card on your table.
- **No other paper materials** are allowed to be used during the exam.
- Using a **calculator** or any electronic device is not permitted during the exam.
- For the **multiple choice** questions, we give :
  +3 points if your answer is correct,
  0 points if you give no answer or more than one,
  −1 points if your answer is incorrect.
- For the **true/false** questions, we give :
  +1 points if your answer is correct,
  0 points if you give no answer or more than one,
  −1 points if your answer is incorrect.
- Use a **black or dark blue ballpen** and clearly erase with **correction fluid** if necessary.
- If a question is wrong, the teacher may decide to nullify it.

Respectez les consignes suivantes | Observe this guidelines | Beachten Sie bitte die unten stehenden Richtlinien

choisir une réponse | select an answer
Antwort auswählen

ne PAS choisir une réponse | NOT select an answer
NICHT Antwort auswählen

Corriger une réponse | Correct an answer
Antwort korrigieren

ce qu'il ne faut **PAS** faire | what should **NOT** be done | was man **NICHT** tun sollte

+6/2/24+

First part: multiple choice questions

For each question, mark the box corresponding to the correct answer. Each question has **exactly one** correct answer.

Question statement with several possible correct answers

- ☐ False Answer Choice
- ☒ False Answer Choice
- ☐ Correct Answer Choice
- ☒ False Answer Choice
- ☐ Other Correct Answer Choice

Let the subset $E \subset \mathbb{R}$ defined by $E = \left\{ 2\left(1+\frac{1}{n}\right)^n : n \in \mathbb{N} \setminus \{0\} \right\}$.

Then

- ☐ the supremum of E belongs to E
- ☐ 10 is a majorant of E
- ☒ the minimum of E is 2
- ☐ E is closed

Question statement with several possible correct answers

- ☐ False Answer Choice
- ☒ False Answer Choice
- ☐ Other Correct Answer Choice
- ☒ Correct Answer Choice
- ☐ False Answer Choice

Question statement with one possible correct answer

- ☐ False Answer Choice
- ☒ False Answer Choice
- ☒ Correct Answer Choice
- ☐ False Answer Choice

First part: multiple choice questions

For each question, mark the box corresponding to the correct answer. Each question has **exactly one** correct answer.

Let $f\colon \mathbb{R} \to \mathbb{R}$ and $g\colon \mathbb{R} \to \mathbb{R}$ are two functions defined on all $\mathbb{R}$. If $f \circ g$ is injective, then g is injective.

☒ TRUE ☐ FALSE

Let A be a bounded and non empty subset of $\mathbb{R}$.
Then $\inf A \in A$ and $\sup A \in A$.

☒ TRUE ☐ FALSE

Third part, open questions

Answer in the empty space below. Your answer should be carefully justified, and all the steps of your argument should be discussed in details. Leave the check-boxes empty, they are used for the grading.

Question 6: *This question is worth 8 points.*

☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 ☐8

We remind you that ...
Determine ...

Question 7: *This question is worth 2 points.*

$\square_0$ $\square_{.5}$ $\square_1$ $\square_{.5}$ $\square_2$

We remind you that ...
Determine ...

+7/1/18+

EPFL

Teacher : **TEACHER**
EXAM - MT
DATE
DURATION

B-4

Student 7

SCIPER : **999006** Room : **R-B** Signature :

Do not turn the page before the start of the exam. This document is double-sided, has 4 pages, the last ones possibly blank. Do not unstaple.

- Place your student card on your table.
- **No other paper materials** are allowed to be used during the exam.
- Using a **calculator** or any electronic device is not permitted during the exam.
- For the **multiple choice** questions, we give :
  +3 points if your answer is correct,
  0 points if you give no answer or more than one,
  −1 points if your answer is incorrect.
- For the **true/false** questions, we give :
  +1 points if your answer is correct,
  0 points if you give no answer or more than one,
  −1 points if your answer is incorrect.
- Use a **black or dark blue ballpen** and clearly erase with **correction fluid** if necessary.
- If a question is wrong, the teacher may decide to nullify it.

Respectez les consignes suivantes | Observe this guidelines | Beachten Sie bitte die unten stehenden Richtlinien

choisir une réponse | select an answer
Antwort auswählen

ne PAS choisir une réponse | NOT select an answer
NICHT Antwort auswählen

Corriger une réponse | Correct an answer
Antwort korrigieren

ce qu'il ne faut **PAS** faire | what should **NOT** be done | was man **NICHT** tun sollte

First part: multiple choice questions

For each question, mark the box corresponding to the correct answer. Each question has **exactly one** correct answer.

Question statement with several possible correct answers

- ☐ Other Correct Answer Choice
- ☐ False Answer Choice
- ☒ Correct Answer Choice
- ☐ False Answer Choice
- ☐ False Answer Choice
- ☒ False Answer Choice

Question statement with several possible correct answers

- ☐ False Answer Choice
- ☐ False Answer Choice
- ☒ Correct Answer Choice
- ☐ False Answer Choice
- ☒ Other Correct Answer Choice

Question statement with one possible correct answer

- ☐ False Answer Choice
- ☒ False Answer Choice
- ☐ Correct Answer Choice
- ☐ False Answer Choice

Let the subset $E \subset \mathbb{R}$ defined by $E = \left\{ 2\left(1+\frac{1}{n}\right)^n : n \in \mathbb{N} \setminus \{0\} \right\}$.

Then

- ☐ the minimum of E is 2
- ☐ the supremum of E belongs to E
- ☒ E is closed
- ☐ 10 is a majorant of E

First part: multiple choice questions

For each question, mark the box corresponding to the correct answer. Each question has **exactly one** correct answer.

Let A be a bounded and non empty subset of $\mathbb{R}$.
Then $\inf A \in A$ and $\sup A \in A$.

☐ TRUE ☒ FALSE

Let $f\colon \mathbb{R} \to \mathbb{R}$ and $g\colon \mathbb{R} \to \mathbb{R}$ are two functions defined on all $\mathbb{R}$. If $f \circ g$ is injective, then g is injective.

☐ TRUE ☒ FALSE

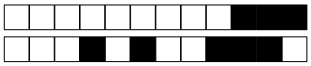
Third part, open questions

Answer in the empty space below. Your answer should be carefully justified, and all the steps of your argument should be discussed in details. Leave the check-boxes empty, they are used for the grading.

Question 6: *This question is worth 8 points.*

☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 ☐8

We remind you that ...
Determine ...



Question 7: *This question is worth 2 points.*

☐0 ☐.5 ☐1 ☐.5 ☐2

We remind you that ...
Determine ...

+8/1/11+

EPFL

Teacher : **TEACHER**
EXAM - SV
DATE
DURATION

B-5

Student 8

SCIPER : **999007** Room : **R-B** Signature :

Do not turn the page before the start of the exam. This document is double-sided, has 4 pages, the last ones possibly blank. Do not unstaple.

- Place your student card on your table.
- **No other paper materials** are allowed to be used during the exam.
- Using a **calculator** or any electronic device is not permitted during the exam.
- For the **multiple choice** questions, we give :
  +3 points if your answer is correct,
  0 points if you give no answer or more than one,
  −1 points if your answer is incorrect.
- For the **true/false** questions, we give :
  +1 points if your answer is correct,
  0 points if you give no answer or more than one,
  −1 points if your answer is incorrect.
- Use a **black or dark blue ballpen** and clearly erase with **correction fluid** if necessary.
- If a question is wrong, the teacher may decide to nullify it.

Respectez les consignes suivantes | Observe this guidelines | Beachten Sie bitte die unten stehenden Richtlinien

choisir une réponse | select an answer
Antwort auswählen

ne PAS choisir une réponse | NOT select an answer
NICHT Antwort auswählen

Corriger une réponse | Correct an answer
Antwort korrigieren

ce qu'il ne faut **PAS** faire | what should **NOT** be done | was man **NICHT** tun sollte

+8/2/10+

First part: multiple choice questions

For each question, mark the box corresponding to the correct answer. Each question has **exactly one** correct answer.

Let the subset $E \subset \mathbb{R}$ defined by $E = \left\{ 2\left(1+\frac{1}{n}\right)^n : n \in \mathbb{N} \setminus \{0\} \right\}$.

Then

- ☐ 10 is a majorant of E
- ☒ the supremum of E belongs to E
- ☐ the minimum of E is 2
- ☐ E is closed

Question statement with several possible correct answers

- ☐ False Answer Choice
- ☒ Correct Answer Choice
- ☒ False Answer Choice
- ☐ False Answer Choice
- ☒ Other Correct Answer Choice

Question statement with several possible correct answers

- ☐ Correct Answer Choice
- ☐ False Answer Choice
- ☐ Other Correct Answer Choice
- ☒ False Answer Choice
- ☒ False Answer Choice

Question statement with one possible correct answer

- ☐ False Answer Choice
- ☐ False Answer Choice
- ☒ Correct Answer Choice
- ☐ False Answer Choice

First part: multiple choice questions

For each question, mark the box corresponding to the correct answer. Each question has **exactly one** correct answer.

Let $f\colon \mathbb{R} \to \mathbb{R}$ and $g\colon \mathbb{R} \to \mathbb{R}$ are two functions defined on all $\mathbb{R}$. If $f \circ g$ is injective, then g is injective.

☐ TRUE ☒ FALSE

Let A be a bounded and non empty subset of $\mathbb{R}$.
Then $\inf A \in A$ and $\sup A \in A$.

☒ TRUE ☐ FALSE

Third part, open questions

Answer in the empty space below. Your answer should be carefully justified, and all the steps of your argument should be discussed in details. Leave the check-boxes empty, they are used for the grading.

Question 6: *This question is worth 8 points.*

☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 ☐8

We remind you that ...
Determine ...

Question 7: *This question is worth 2 points.*

☐0 ☐.5 ☐1 ☐.5 ☐2

We remind you that ...
Determine ...

+9/1/4+

EPFL

Teacher : **TEACHER**
EXAM - -
DATE
DURATION

B-6

Student 9

SCIPER : **999008** Room : **R-B** Signature :

Do not turn the page before the start of the exam. This document is double-sided, has 4 pages, the last ones possibly blank. Do not unstaple.

- Place your student card on your table.
- **No other paper materials** are allowed to be used during the exam.
- Using a **calculator** or any electronic device is not permitted during the exam.
- For the **multiple choice** questions, we give :
  +3 points if your answer is correct,
  0 points if you give no answer or more than one,
  −1 points if your answer is incorrect.
- For the **true/false** questions, we give :
  +1 points if your answer is correct,
  0 points if you give no answer or more than one,
  −1 points if your answer is incorrect.
- Use a **black or dark blue ballpen** and clearly erase with **correction fluid** if necessary.
- If a question is wrong, the teacher may decide to nullify it.

Respectez les consignes suivantes | Observe this guidelines | Beachten Sie bitte die unten stehenden Richtlinien

choisir une réponse | select an answer
Antwort auswählen

ne PAS choisir une réponse | NOT select an answer
NICHT Antwort auswählen

Corriger une réponse | Correct an answer
Antwort korrigieren

ce qu'il ne faut **PAS** faire | what should **NOT** be done | was man **NICHT** tun sollte

First part: multiple choice questions

For each question, mark the box corresponding to the correct answer. Each question has **exactly one** correct answer.

Question statement with several possible correct answers

- ☐ False Answer Choice
- ☐ False Answer Choice
- ☒ Correct Answer Choice
- ☐ False Answer Choice
- ☒ Other Correct Answer Choice

Question statement with several possible correct answers

- ☒ Correct Answer Choice
- ☐ False Answer Choice
- ☐ False Answer Choice
- ☒ Other Correct Answer Choice
- ☐ False Answer Choice

Question statement with one possible correct answer

- ☒ Correct Answer Choice
- ☐ False Answer Choice
- ☐ False Answer Choice
- ☐ False Answer Choice

Let the subset $E \subset \mathbb{R}$ defined by $E = \left\{ 2\left(1+\frac{1}{n}\right)^n : n \in \mathbb{N} \setminus \{0\} \right\}$.

Then

- ☐ the minimum of E is 2
- ☐ E is closed
- ☒ 10 is a majorant of E
- ☐ the supremum of E belongs to E

First part: multiple choice questions

For each question, mark the box corresponding to the correct answer. Each question has **exactly one** correct answer.

Let A be a bounded and non empty subset of $\mathbb{R}$.
Then $\inf A \in A$ and $\sup A \in A$.

☐ TRUE ☒ FALSE

Let $f\colon \mathbb{R} \to \mathbb{R}$ and $g\colon \mathbb{R} \to \mathbb{R}$ are two functions defined on all $\mathbb{R}$. If $f \circ g$ is injective, then g is injective.

☒ TRUE ☐ FALSE

Third part, open questions

Answer in the empty space below. Your answer should be carefully justified, and all the steps of your argument should be discussed in details. Leave the check-boxes empty, they are used for the grading.

Question 6: *This question is worth 8 points.*

☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 ☐8

We remind you that ...
Determine ...

+9/5/60+

Question 7: *This question is worth 2 points.*

☐0 ☐.5 ☐1 ☐.5 ☐2

We remind you that ...
Determine ...

+10/1/57+

EPFL

Teacher : **TEACHER**
EXAM - -
DATE
DURATION

B-7

Student 10

SCIPER : **999009** Room : **R-B** Signature :

Do not turn the page before the start of the exam. This document is double-sided, has 4 pages, the last ones possibly blank. Do not unstaple.

- Place your student card on your table.
- **No other paper materials** are allowed to be used during the exam.
- Using a **calculator** or any electronic device is not permitted during the exam.
- For the **multiple choice** questions, we give :
  +3 points if your answer is correct,
  0 points if you give no answer or more than one,
  −1 points if your answer is incorrect.
- For the **true/false** questions, we give :
  +1 points if your answer is correct,
  0 points if you give no answer or more than one,
  −1 points if your answer is incorrect.
- Use a **black or dark blue ballpen** and clearly erase with **correction fluid** if necessary.
- If a question is wrong, the teacher may decide to nullify it.

Respectez les consignes suivantes | Observe this guidelines | Beachten Sie bitte die unten stehenden Richtlinien

choisir une réponse | select an answer
Antwort auswählen

ne PAS choisir une réponse | NOT select an answer
NICHT Antwort auswählen

Corriger une réponse | Correct an answer
Antwort korrigieren

ce qu'il ne faut **PAS** faire | what should **NOT** be done | was man **NICHT** tun sollte

First part: multiple choice questions

For each question, mark the box corresponding to the correct answer. Each question has **exactly one** correct answer.

Question statement with several possible correct answers

- ☐ Other Correct Answer Choice
- ☐ False Answer Choice
- ☒ Correct Answer Choice
- ☒ False Answer Choice
- ☐ False Answer Choice

Let the subset $E \subset \mathbb{R}$ defined by $E = \left\{ 2\left(1+\frac{1}{n}\right)^n : n \in \mathbb{N} \setminus \{0\} \right\}$.

Then

- ☐ the supremum of E belongs to E
- ☐ 10 is a majorant of E
- ☒ the minimum of E is 2
- ☐ E is closed

Question statement with one possible correct answer

- ☐ False Answer Choice
- ☒ Correct Answer Choice
- ☐ False Answer Choice
- ☐ False Answer Choice

Question statement with several possible correct answers

- ☐ False Answer Choice
- ☒ False Answer Choice
- ☒ Other Correct Answer Choice
- ☐ False Answer Choice
- ☐ Correct Answer Choice

First part: multiple choice questions

For each question, mark the box corresponding to the correct answer. Each question has **exactly one** correct answer.

Let A be a bounded and non empty subset of $\mathbb{R}$.
Then $\inf A \in A$ and $\sup A \in A$.

☐ TRUE ☒ FALSE

Let $f\colon \mathbb{R} \to \mathbb{R}$ and $g\colon \mathbb{R} \to \mathbb{R}$ are two functions defined on all $\mathbb{R}$. If $f \circ g$ is injective, then g is injective.

☐ TRUE ☒ FALSE

Third part, open questions

Answer in the empty space below. Your answer should be carefully justified, and all the steps of your argument should be discussed in details. Leave the check-boxes empty, they are used for the grading.

Question 6: *This question is worth 8 points.*

☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 ☐8

We remind you that ...
Determine ...

Question 7: *This question is worth 2 points.*

$\square_0$ $\square_{.5}$ $\square_1$ $\square_{.5}$ $\square_2$

We remind you that ...
Determine ...