MULTIPLE-CHOICE TEST
in MATHEMATICS

1. (10p) If x_1 and x_2 are the solutions of the equation $x^2-(2m-3)x+m-1=0$, $m \in \boldsymbol{R}$, then the value of the expression $S=x_1+x_2-2x_1x_2$ is:

a. -1
b. 0
c. m
d. $2m-3$
e. $m-1$

2. (5p) Let $f:\boldsymbol{R} \to \boldsymbol{R}, f(x)=x^2+5x+m+6$. The value of $m \in \boldsymbol{R}$ such that $f(x) \geq 0$, $\forall x \in \boldsymbol{R}$ satisfies:

a. $m \in (-1, \frac{1}{8})$
b. $m \in [\frac{1}{4}, +\infty)$
c. $m < 0$
d. $m \in (-1, 0)$
e. $m \in \{-1, 0\}$

3. (5p) The sum of the solutions of the equation $\log_3(x^2+3)-\log_3(4x)=0$ belongs to the interval:

a. $(2,4)$
b. $(2,5)$
c. $(4,6]$
d. $[0,3]$
e. $[1,4)$

4. (10p) If the numbers $2,\ a,\ b$ are in geometric progression and the numbers $2,\ 9,\ a$ are in arithmetic progression, then $\sqrt{a+b}$ is:

a. 12
b. $12\sqrt{2}$
c. 14
d. $11\sqrt{2}$
e. 13

5. (10p) If $A=\begin{pmatrix} m & m+1 & m+2 \\ n & n+1 & n+2 \\ 1 & 1 & m \end{pmatrix} \in M_3(\boldsymbol{R})$ and ${}^tA$ is the transpose of A, then:

a. $rank\ A < 2$
b. $\det(A - {}^tA) = -1$
c. $\det(A - {}^tA) = 0$
d. $\det(A - {}^tA) = 1$
e. $rank\ A = 1$

6. (10p) Consider the system

$$\begin{cases} (a-2)x - 2y + z = 1 \\ x + y + z = a - 2 \\ (a-1)x - 2y + 2z = 1 \end{cases}, \quad \text{where } a \in \boldsymbol{R}.$$

The system is compatible determined (that is, it has a unique solution) for:

a. $a \in \boldsymbol{R} \setminus \{3\}$
b. $a = 3$
c. $a \in \{-3, 3\}$
d. $a \in (-\infty, 0)$
e. $a \in [-1, 1]$

7. (10p) If $L = \lim\limits_{n \to +\infty} \frac{4^{-3n} - 4^{9n}}{4^{-n} - 4^{3n}}$ then:

a. $L = \ln 4$
b. $L = e$
c. $L = 0$
d. $L = +\infty$
e. $L = 1$

8. (10p) Let $f: (0, +\infty) \to \boldsymbol{R}$, defined by

$$f(x) = \frac{\ln x}{x}.$$

Then its derivative $f'(x)$ is equal to:

a. $\frac{\ln x}{x^2}$
b. $\frac{1 + \ln x}{x^2}$
c. $\frac{1 + x\ln x}{x^2}$
d. $\frac{1 - \ln x}{x^2}$
e. $\frac{1 - x\ln x}{x^2}$

9. (10p) Let $a, b, c \in \boldsymbol{R}$. If $F: \boldsymbol{R} \to \boldsymbol{R}, F(x) = 2ae^{bx^2+b} + 3cx^3$ is a primitive of the function $f: \boldsymbol{R} \to \boldsymbol{R}, f(x) = 2xe^{x^2+1} + 3x^2$ then the value of the expression $S = e^{b-1} - \log_6(ac)$ is:

a. 2
b. 0
c. -1
d. $e + 1$
e. $1 - e$

10. (10p) Let $I_n = \int_1^2 x^{n-\frac{1}{2}} e^x dx,\ n \in \boldsymbol{N} \setminus \{0\}$. Then, for all $n \in \boldsymbol{N} \setminus \{0,1\}$ the expression $S = I_n + \frac{2n-1}{2} I_{n-1}$ is equal to:

a. $e - 2^{n-\frac{1}{2}} e^2$
b. $e\left(2^{n+\frac{1}{2}} - e\right)$
c. $e\left(2^{n+\frac{1}{2}} e - 1\right)$
d. $e\, 2^n + e^2$
e. $2^{n-\frac{1}{2}} e^2 - e$

MULTIPLE-CHOICE TEST
in MATHEMATICS

1. (10p) Let $f: (0, +\infty) \to \boldsymbol{R}$, defined by

$$f(x) = \frac{\ln x}{x}.$$

Then its derivative $f'(x)$ is equal to:

a. $\frac{1-\ln x}{x^2}$
b. $\frac{1+x\ln x}{x^2}$
c. $\frac{1+\ln x}{x^2}$
d. $\frac{1-x\ln x}{x^2}$
e. $\frac{\ln x}{x^2}$

2. (5p) The sum of the solutions of the equation $\log_3(x^2+3) - \log_3(4x) = 0$ belongs to the interval:

a. $(4,6]$
b. $[0,3]$
c. $(2,5)$
d. $[1,4)$
e. $(2,4)$

3. (10p) Let $I_n = \int_1^2 x^{n-\frac{1}{2}}\, e^x \mathrm{d}x,\ n \in \boldsymbol{N}\backslash\{0\}$. Then, for all $n \in \boldsymbol{N}\backslash\{0,1\}$ the expression $S = I_n + \frac{2n-1}{2} I_{n-1}$ is equal to:

a. $e\left(2^{n+\frac{1}{2}} e - 1\right)$
b. $e - 2^{n-\frac{1}{2}} e^2$
c. $2^{n-\frac{1}{2}} e^2 - e$
d. $e\left(2^{n+\frac{1}{2}} - e\right)$
e. $e\, 2^n + e^2$

4. (10p) If x_1 and x_2 are the solutions of the equation $x^2 - (2m-3)x + m - 1 = 0$, $m \in \boldsymbol{R}$, then the value of the expression $S = x_1 + x_2 - 2x_1x_2$ is:

a. $2m-3$
b. 0
c. $m-1$
d. m
e. -1

5. (10p) If the numbers $2,\ a,\ b$ are in geometric progression and the numbers $2,\ 9,\ a$ are in arithmetic progression, then $\sqrt{a+b}$ is:

a. $12\sqrt{2}$
b. 14
c. 13
d. 12

e. $11\sqrt{2}$

6. (10p) Consider the system

$$\begin{cases} (a-2)x - 2y + z = 1 \\ x + y + z = a - 2 \\ (a-1)x - 2y + 2z = 1 \end{cases}, \quad \text{where } a \in \boldsymbol{R}.$$

The system is compatible determined (that is, it has a unique solution) for:

a. $a = 3$
b. $a \in (-\infty, 0)$
c. $a \in [-1, 1]$
d. $a \in \boldsymbol{R} \setminus \{3\}$
e. $a \in \{-3, 3\}$

7. (10p) Let $a, b, c \in \boldsymbol{R}$. If $F: \boldsymbol{R} \to \boldsymbol{R}, F(x) = 2ae^{bx^2+b} + 3cx^3$ is a primitive of the function $f: \boldsymbol{R} \to \boldsymbol{R}, f(x) = 2xe^{x^2+1} + 3x^2$ then the value of the expression $S = e^{b-1} - \log_6(ac)$ is:

a. -1
b. 0
c. $e + 1$
d. $1 - e$
e. 2

8. (10p) If $\boldsymbol{A} = \begin{pmatrix} m & m+1 & m+2 \\ n & n+1 & n+2 \\ 1 & 1 & m \end{pmatrix} \in M_3(\boldsymbol{R})$ and ${}^tA$ is the transpose of A, then:

a. $rank\ A = 1$
b. $\det(A - {}^tA) = -1$
c. $\det(A - {}^tA) = 0$
d. $rank\ A < 2$
e. $\det(A - {}^tA) = 1$

9. (10p) If $L = \lim_{n\to+\infty} \frac{4^{-3n} - 4^{9n}}{4^{-n} - 4^{3n}}$ then:

a. $L = 0$
b. $L = +\infty$
c. $L = 1$
d. $L = e$
e. $L = \ln 4$

10. (5p) Let $f: \boldsymbol{R} \to \boldsymbol{R}, f(x) = x^2 + 5x + m + 6$. The value of $m \in \boldsymbol{R}$ such that $f(x) \geq 0$, $\forall x \in \boldsymbol{R}$ satisfies:

a. $m \in [\frac{1}{4}, +\infty)$
b. $m \in (-1, 0)$
c. $m \in (-1, \frac{1}{8})$
d. $m \in \{-1, 0\}$
e. $m < 0$

MULTIPLE-CHOICE TEST
in MATHEMATICS

1. (10p) Let $f: (0, +\infty) \to \boldsymbol{R}$, defined by
$$f(x) = \frac{\ln x}{x}.$$
Then its derivative $f'(x)$ is equal to:

a. $\frac{1-\ln x}{x^2}$
b. $\frac{1+\ln x}{x^2}$
c. $\frac{1-x\ln x}{x^2}$
d. $\frac{1+x\ln x}{x^2}$
e. $\frac{\ln x}{x^2}$

2. (5p) The sum of the solutions of the equation $\log_3(x^2+3) - \log_3(4x) = 0$ belongs to the interval:

a. $(2,4)$
b. $[0,3]$
c. $(2,5)$
d. $[1,4)$
e. $(4,6]$

3. (5p) Let $f: \boldsymbol{R} \to \boldsymbol{R}, f(x) = x^2 + 5x + m + 6$. The value of $m \in \boldsymbol{R}$ such that $f(x) \geq 0$, $\forall x \in \boldsymbol{R}$ satisfies:

a. $m \in (-1, 0)$
b. $m \in (-1, \frac{1}{8})$
c. $m \in \{-1, 0\}$
d. $m < 0$
e. $m \in [\frac{1}{4}, +\infty)$

4. (10p) Let $a, b, c \in \boldsymbol{R}$. If $F: \boldsymbol{R} \to \boldsymbol{R}, F(x) = 2ae^{bx^2+b} + 3cx^3$ is a primitive of the function $f: \boldsymbol{R} \to \boldsymbol{R}, f(x) = 2xe^{x^2+1} + 3x^2$ then the value of the expression $S = e^{b-1} - \log_6(ac)$ is:

a. 0
b. -1
c. 2
d. $1-e$
e. $e+1$

5. (10p) Let $I_n = \int_1^2 x^{n-\frac{1}{2}} e^x \mathrm{d}x,\ n \in \boldsymbol{N}\backslash\{0\}$. Then, for all $n \in \boldsymbol{N}\backslash\{0,1\}$ the expression $S = I_n + \frac{2n-1}{2} I_{n-1}$ is equal to:

a. $e - 2^{n-\frac{1}{2}} e^2$
b. $2^{n-\frac{1}{2}} e^2 - e$
c. $e\, 2^n + e^2$

d. $e\left(2^{n+\frac{1}{2}}e-1\right)$
e. $e\left(2^{n+\frac{1}{2}}-e\right)$

6. (10p) If $L=\lim\limits_{n\to+\infty}\frac{4^{-3n}-4^{9n}}{4^{-n}-4^{3n}}$ then:
a. $L=1$
b. $L=\ln 4$
c. $L=0$
d. $L=e$
e. $L=+\infty$

7. (10p) Consider the system

$$\begin{cases}(a-2)x-2y+z=1\\ x+y+z=a-2\\ (a-1)x-2y+2z=1\end{cases},\quad \text{where } a\in\boldsymbol{R}.$$

The system is compatible determined (that is, it has a unique solution) for:
a. $a=3$
b. $a\in\boldsymbol{R}\setminus\{3\}$
c. $a\in\{-3,3\}$
d. $a\in[-1,1]$
e. $a\in(-\infty,0)$

8. (10p) If $\boldsymbol{A}=\begin{pmatrix}m & m+1 & m+2\\ n & n+1 & n+2\\ 1 & 1 & m\end{pmatrix}\in M_3(\boldsymbol{R})$ and ${}^tA$ is the transpose of A, then:

a. $\det(A-{}^tA)=0$
b. $\det(A-{}^tA)=1$
c. $rank\ A<2$
d. $rank\ A=1$
e. $\det(A-{}^tA)=-1$

9. (10p) If x_1 and x_2 are the solutions of the equation $x^2-(2m-3)x+m-1=0$, $m\in\boldsymbol{R}$, then the value of the expression $S=x_1+x_2-2x_1x_2$ is:
a. m
b. $2m-3$
c. $m-1$
d. -1
e. 0

10. (10p) If the numbers $2,\ a,\ b$ are in geometric progression and the numbers $2,\ 9,\ a$ are in arithmetic progression, then $\sqrt{a+b}$ is:
a. $11\sqrt{2}$
b. 12
c. $12\sqrt{2}$
d. 14
e. 13

BUCHAREST UNIVERSITY OF ECONOMIC STUDIES
FACULTY OF ECONOMIC CYBERNETICS, STATISTICS AND INFORMATICS Test code: ***MEnc4***

MULTIPLE-CHOICE TEST
in MATHEMATICS

1. (10p) If $L = \lim\limits_{n\to+\infty} \frac{4^{-3n}-4^{9n}}{4^{-n}-4^{3n}}$ then:

a. $L = 0$
b. $L = +\infty$
c. $L = \ln 4$
d. $L = 1$
e. $L = e$

2. (10p) If the numbers $2,\ a,\ b$ are in geometric progression and the numbers $2,\ 9,\ a$ are in arithmetic progression, then $\sqrt{a+b}$ is:

a. 14
b. $12\sqrt{2}$
c. 12
d. 13
e. $11\sqrt{2}$

3. (10p) If x_1 and x_2 are the solutions of the equation $x^2-(2m-3)x+m-1=0$, $m \in \boldsymbol{R}$, then the value of the expression $S = x_1+x_2-2x_1x_2$ is:

a. $2m-3$
b. m
c. $m-1$
d. 0
e. -1

4. (10p) Let $f: (0,+\infty) \to \boldsymbol{R}$, defined by

$$f(x) = \frac{\ln x}{x}.$$

Then its derivative $f'(x)$ is equal to:

a. $\frac{1+x\ln x}{x^2}$
b. $\frac{1+\ln x}{x^2}$
c. $\frac{1-\ln x}{x^2}$
d. $\frac{1-x\ln x}{x^2}$
e. $\frac{\ln x}{x^2}$

5. (10p) Let $I_n = \int_1^2 x^{n-\frac{1}{2}}\, e^x \mathrm{d}x,\ n \in \boldsymbol{N}\setminus\{0\}$. Then, for all $n \in \boldsymbol{N}\setminus\{0,1\}$ the expression $S = I_n + \frac{2n-1}{2} I_{n-1}$ is equal to:

a. $2^{n-\frac{1}{2}}\, e^2 - e$
b. $e\left(2^{n+\frac{1}{2}}\, e - 1\right)$
c. $e\left(2^{n+\frac{1}{2}} - e\right)$
d. $e\ 2^n + e^2$

e. $e - 2^{n-\frac{1}{2}} e^2$

6. (10p) If $A = \begin{pmatrix} m & m+1 & m+2 \\ n & n+1 & n+2 \\ 1 & 1 & m \end{pmatrix} \in M_3(\boldsymbol{R})$ and ${}^tA$ is the transpose of A, then:

a. $rank\ A = 1$
b. $\det(A - {}^tA) = -1$
c. $rank\ A < 2$
d. $\det(A - {}^tA) = 0$
e. $\det(A - {}^tA) = 1$

7. (5p) The sum of the solutions of the equation $\log_3(x^2+3) - \log_3(4x) = 0$ belongs to the interval:

a. $[0,3]$
b. $(2,4)$
c. $(4,6]$
d. $[1,4)$
e. $(2,5)$

8. (10p) Let $a, b, c \in \boldsymbol{R}$. If $F: \boldsymbol{R} \to \boldsymbol{R}, F(x) = 2ae^{bx^2+b} + 3cx^3$ is a primitive of the function $f: \boldsymbol{R} \to \boldsymbol{R}, f(x) = 2xe^{x^2+1} + 3x^2$ then the value of the expression $S = e^{b-1} - \log_6(ac)$ is:

a. $e+1$
b. 2
c. -1
d. $1-e$
e. 0

9. (10p) Consider the system

$$\begin{cases} (a-2)x - 2y + z = 1 \\ x + y + z = a - 2 \\ (a-1)x - 2y + 2z = 1 \end{cases}, \quad \text{where } a \in \boldsymbol{R}.$$

The system is compatible determined (that is, it has a unique solution) for:

a. $a \in (-\infty, 0)$
b. $a \in [-1, 1]$
c. $a \in \{-3, 3\}$
d. $a \in \boldsymbol{R} \backslash \{3\}$
e. $a = 3$

10. (5p) Let $f: \boldsymbol{R} \to \boldsymbol{R}, f(x) = x^2 + 5x + m + 6$. The value of $m \in \boldsymbol{R}$ such that $f(x) \geq 0$, $\forall x \in \boldsymbol{R}$ satisfies:

a. $m \in [\frac{1}{4}, +\infty)$
b. $m < 0$
c. $m \in (-1, \frac{1}{8})$
d. $m \in \{-1, 0\}$
e. $m \in (-1, 0)$

MULTIPLE-CHOICE TEST
in MATHEMATICS

1. (10p) If the numbers $2,\ a,\ b$ are in geometric progression and the numbers $2,\ 9,\ a$ are in arithmetic progression, then $\sqrt{a+b}$ is:

a. 14
b. $12\sqrt{2}$
c. 13
d. $11\sqrt{2}$
e. 12

2. (10p) Let $f\colon(0,+\infty)\to\boldsymbol{R}$, defined by

$$f(x)=\frac{\ln x}{x}.$$

Then its derivative $f'(x)$ is equal to:

a. $\frac{1-x\ln x}{x^2}$
b. $\frac{1+x\ln x}{x^2}$
c. $\frac{1-\ln x}{x^2}$
d. $\frac{\ln x}{x^2}$
e. $\frac{1+\ln x}{x^2}$

3. (5p) Let $f\colon\boldsymbol{R}\to\boldsymbol{R}, f(x)=x^2+5x+m+6$. The value of $m\in\boldsymbol{R}$ such that $f(x)\geq 0$, $\forall x\in\boldsymbol{R}$ satisfies:

a. $m\in[\frac{1}{4},+\infty)$
b. $m\in(-1,0)$
c. $m\in(-1,\frac{1}{8})$
d. $m\in\{-1,0\}$
e. $m<0$

4. (10p) Let $a,b,c\in\boldsymbol{R}$. If $F\colon\boldsymbol{R}\to\boldsymbol{R}, F(x)=2ae^{bx^2+b}+3cx^3$ is a primitive of the function $f\colon\boldsymbol{R}\to\boldsymbol{R}, f(x)=2xe^{x^2+1}+3x^2$ then the value of the expression $S=e^{b-1}-\log_6(ac)$ is:

a. $e+1$
b. 2
c. 0
d. -1
e. $1-e$

5. (10p) Consider the system

$$\begin{cases}(a-2)x-2y+z=1\\ x+y+z=a-2\\ (a-1)x-2y+2z=1\end{cases},\qquad \text{where } a\in\boldsymbol{R}.$$

The system is compatible determined (that is, it has a unique solution) for:

a. $a\in[-1,1]$

b. $a = 3$
c. $a \in \{-3, 3\}$
d. $a \in \boldsymbol{R}\setminus\{3\}$
e. $a \in (-\infty, 0)$

6. (10p) If $L = \lim\limits_{n\to+\infty} \frac{4^{-3n}-4^{9n}}{4^{-n}-4^{3n}}$ then:
a. $L = +\infty$
b. $L = 1$
c. $L = e$
d. $L = 0$
e. $L = \ln 4$

7. (10p) Let $I_n = \int_1^2 x^{n-\frac{1}{2}} e^x dx,\ n \in \boldsymbol{N}\setminus\{0\}$. Then, for all $n \in \boldsymbol{N}\setminus\{0,1\}$ the expression $S = I_n + \frac{2n-1}{2} I_{n-1}$ is equal to:
a. $e\,2^n + e^2$
b. $e\left(2^{n+\frac{1}{2}} - e\right)$
c. $e\left(2^{n+\frac{1}{2}} e - 1\right)$
d. $2^{n-\frac{1}{2}} e^2 - e$
e. $e - 2^{n-\frac{1}{2}} e^2$

8. (5p) The sum of the solutions of the equation $\log_3(x^2+3) - \log_3(4x) = 0$ belongs to the interval:
a. $[1, 4)$
b. $(2, 4)$
c. $(2, 5)$
d. $(4, 6]$
e. $[0, 3]$

9. (10p) If x_1 and x_2 are the solutions of the equation $x^2 - (2m-3)x + m - 1 = 0$, $m \in \boldsymbol{R}$, then the value of the expression $S = x_1 + x_2 - 2x_1x_2$ is:
a. m
b. 0
c. $2m - 3$
d. $m - 1$
e. -1

10. (10p) If $\boldsymbol{A} = \begin{pmatrix} m & m+1 & m+2 \\ n & n+1 & n+2 \\ 1 & 1 & m \end{pmatrix} \in M_3(\boldsymbol{R})$ and ${}^tA$ is the transpose of A, then:

a. $rank\ A = 1$
b. $\det(A - {}^tA) = 0$
c. $rank\ A < 2$
d. $\det(A - {}^tA) = 1$
e. $\det(A - {}^tA) = -1$

BUCHAREST UNIVERSITY OF ECONOMIC STUDIES
FACULTY OF ECONOMIC CYBERNETICS, STATISTICS AND INFORMATICS Test code: ***MEnc6***

MULTIPLE-CHOICE TEST
in MATHEMATICS

1. (10p) If $\boldsymbol{A} = \begin{pmatrix} m & m+1 & m+2 \\ n & n+1 & n+2 \\ 1 & 1 & m \end{pmatrix} \in M_3(\boldsymbol{R})$ and ${}^tA$ is the transpose of A, then:

a. $\det(A - {}^tA) = 1$
b. $rank\ A < 2$
c. $rank\ A = 1$
d. $\det(A - {}^tA) = -1$
e. $\det(A - {}^tA) = 0$

2. (5p) Let $f: \boldsymbol{R} \to \boldsymbol{R}, f(x) = x^2 + 5x + m + 6$. The value of $m \in \boldsymbol{R}$ such that $f(x) \geq 0$, $\forall x \in \boldsymbol{R}$ satisfies:

a. $m \in \{-1, 0\}$
b. $m < 0$
c. $m \in [\frac{1}{4}, +\infty)$
d. $m \in (-1, 0)$
e. $m \in (-1, \frac{1}{8})$

3. (10p) If $L = \lim_{n \to +\infty} \frac{4^{-3n} - 4^{9n}}{4^{-n} - 4^{3n}}$ then:

a. $L = +\infty$
b. $L = e$
c. $L = 1$
d. $L = 0$
e. $L = \ln 4$

4. (10p) If the numbers $2,\ a,\ b$ are in geometric progression and the numbers $2,\ 9,\ a$ are in arithmetic progression, then $\sqrt{a+b}$ is:

a. $11\sqrt{2}$
b. $12\sqrt{2}$
c. 12
d. 13
e. 14

5. (10p) If x_1 and x_2 are the solutions of the equation $x^2 - (2m-3)x + m - 1 = 0$, $m \in \boldsymbol{R}$, then the value of the expression $S = x_1 + x_2 - 2x_1x_2$ is:

a. $2m - 3$
b. m
c. 0
d. -1
e. $m - 1$

6. (10p) Let $f: (0, +\infty) \to \boldsymbol{R}$, defined by

$$f(x) = \frac{\ln x}{x}.$$

Then its derivative $f'(x)$ is equal to:

a. $\frac{1+x\ln x}{x^2}$
b. $\frac{1-\ln x}{x^2}$
c. $\frac{1+\ln x}{x^2}$
d. $\frac{1-x\ln x}{x^2}$
e. $\frac{\ln x}{x^2}$

7. (10p) Consider the system

$$\begin{cases} (a-2)x-2y+z=1 \\ x+y+z=a-2 \\ (a-1)x-2y+2z=1 \end{cases}, \quad \text{where } a \in \boldsymbol{R}.$$

The system is compatible determined (that is, it has a unique solution) for:

a. $a \in (-\infty, 0)$
b. $a = 3$
c. $a \in \{-3, 3\}$
d. $a \in [-1, 1]$
e. $a \in \boldsymbol{R}\setminus\{3\}$

8. (10p) Let $I_n = \int_1^2 x^{n-\frac{1}{2}} e^x \mathrm{d}x,\ n \in \boldsymbol{N}\setminus\{0\}$. Then, for all $n \in \boldsymbol{N}\setminus\{0,1\}$ the expression $S = I_n + \frac{2n-1}{2} I_{n-1}$ is equal to:

a. $e\,2^n + e^2$
b. $e - 2^{n-\frac{1}{2}} e^2$
c. $2^{n-\frac{1}{2}} e^2 - e$
d. $e\left(2^{n+\frac{1}{2}} e - 1\right)$
e. $e\left(2^{n+\frac{1}{2}} - e\right)$

9. (5p) The sum of the solutions of the equation $\log_3(x^2+3) - \log_3(4x) = 0$ belongs to the interval:

a. $(4, 6]$
b. $[0, 3]$
c. $(2, 4)$
d. $[1, 4)$
e. $(2, 5)$

10. (10p) Let $a, b, c \in \boldsymbol{R}$. If $F: \boldsymbol{R} \to \boldsymbol{R}, F(x) = 2ae^{bx^2+b} + 3cx^3$ is a primitive of the function $f: \boldsymbol{R} \to \boldsymbol{R}, f(x) = 2xe^{x^2+1} + 3x^2$ then the value of the expression $S = e^{b-1} - \log_6(ac)$ is:

a. 0
b. $e+1$
c. -1
d. 2
e. $1-e$