

ANALISI MATEMATICA B - 20 marzo 2008 - C.d.L.: AUTL-AMBL-CIVL-GESL-INFL-MATL-MECL. Il numero del compito corrisponde all'ascissa del dato iniziale del problema di Cauchy: ad esempio se  $y(3) = 0$  nell'esercizio 2, allora il compito è il numero 3.

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### COMPITO 1

1.  $3 \arctan^2 \sqrt{x-1}$
  2.  $e^{-1} - 1$
  3.  $A_\alpha = \{(x, y) \in \mathbb{R}^2 : 0 \leq x^2 + y^2 < \alpha\}$  se  $\alpha < 1$ ,  $A_\alpha = \mathbb{R}^2 \setminus \{(0, 0)\}$  se  $\alpha = 1$ ,  $A_\alpha = \{(x, y) \in \mathbb{R}^2 : \alpha - 1 < x^2 + y^2 < \alpha\}$  se  $\alpha > 1$ .
  4.  $(\pm 2, 0)$  minimi,  $(0, 0)$  sella.
  5.  $m = 0$  assunto su  $\{(x, y) \in \mathbb{R}^2 : x = 0, 1 \leq y \leq 7\}$  e  $M = 7e^7$  assunto su  $\{(x, y) \in \mathbb{R}^2 : xy = 7, 1 \leq y \leq 7\}$
  6.  $\gamma(t) = [-2 \cos t + 3]\vec{i} - 2[\sin t - 1]\vec{j}$ .
  7.  $\alpha = 2$ .
  8.  $8\pi$
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### COMPITO 2

1.  $5 \arctan^2 \sqrt{x-1}$
  2.  $e^{-4} - 1$
  3.  $A_\alpha = \{(x, y) \in \mathbb{R}^2 : 0 \leq x^2 + y^2 < \alpha\}$  se  $\alpha < 2$ ,  $A_\alpha = \mathbb{R}^2 \setminus \{(0, 0)\}$  se  $\alpha = 2$ ,  $A_\alpha = \{(x, y) \in \mathbb{R}^2 : \alpha - 2 < x^2 + y^2 < \alpha\}$  se  $\alpha > 2$ .
  4.  $(\pm 3, 0)$  minimi,  $(0, 0)$  sella.
  5.  $m = 0$  assunto su  $\{(x, y) \in \mathbb{R}^2 : x = 0, 1 \leq y \leq 6\}$  e  $M = 6e^6$  assunto su  $\{(x, y) \in \mathbb{R}^2 : xy = 6, 1 \leq y \leq 6\}$
  6.  $\gamma(t) = [-3 \cos t + 4]\vec{i} - 3[\sin t - 1]\vec{j}$ .
  7.  $\alpha = 3$ .
  8.  $27\pi$
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### COMPITO 3

1.  $7 \arctan^2 \sqrt{x-1}$
2.  $e^{-9} - 1$
3.  $A_\alpha = \{(x, y) \in \mathbb{R}^2 : 0 \leq x^2 + y^2 < \alpha\}$  se  $\alpha < 3$ ,  $A_\alpha = \mathbb{R}^2 \setminus \{(0, 0)\}$  se  $\alpha = 3$ ,  $A_\alpha = \{(x, y) \in \mathbb{R}^2 : \alpha - 3 < x^2 + y^2 < \alpha\}$  se  $\alpha > 3$ .
4.  $(\pm 4, 0)$  minimi,  $(0, 0)$  sella.
5.  $m = 0$  assunto su  $\{(x, y) \in \mathbb{R}^2 : x = 0, 1 \leq y \leq 5\}$  e  $M = 5e^5$  assunto su  $\{(x, y) \in \mathbb{R}^2 : xy = 5, 1 \leq y \leq 5\}$

6.  $\gamma(t) = [-4 \cos t + 5]\vec{i} - 4[\sin t - 1]\vec{j}$ .

7.  $\alpha = 4$ .

8.  $64\pi$

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#### COMPITO 4

1.  $9 \arctan^2 \sqrt{x-1}$

2.  $e^{-16} - 1$

3.  $A_\alpha = \{(x, y) \in \mathbb{R}^2 : 0 \leq x^2 + y^2 < \alpha\}$  se  $\alpha < 4$ ,  $A_\alpha = \mathbb{R}^2 \setminus \{(0, 0)\}$  se  $\alpha = 4$ ,  $A_\alpha = \{(x, y) \in \mathbb{R}^2 : \alpha - 4 < x^2 + y^2 < \alpha\}$  se  $\alpha > 4$ .

4.  $(\pm 5, 0)$  minimi,  $(0, 0)$  sella.

5.  $m = 0$  assunto su  $\{(x, y) \in \mathbb{R}^2 : x = 0, 1 \leq y \leq 4\}$  e  $M = 4e^4$  assunto su  $\{(x, y) \in \mathbb{R}^2 : xy = 4, 1 \leq y \leq 4\}$

6.  $\gamma(t) = [-5 \cos t + 6]\vec{i} - 5[\sin t - 1]\vec{j}$ .

7.  $\alpha = 5$ .

8.  $125\pi$

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#### COMPITO 5

1.  $11 \arctan^2 \sqrt{x-1}$

2.  $e^{-25} - 1$

3.  $A_\alpha = \{(x, y) \in \mathbb{R}^2 : 0 \leq x^2 + y^2 < \alpha\}$  se  $\alpha < 5$ ,  $A_\alpha = \mathbb{R}^2 \setminus \{(0, 0)\}$  se  $\alpha = 5$ ,  $A_\alpha = \{(x, y) \in \mathbb{R}^2 : \alpha - 5 < x^2 + y^2 < \alpha\}$  se  $\alpha > 5$ .

4.  $(\pm 6, 0)$  minimi,  $(0, 0)$  sella.

5.  $m = 0$  assunto su  $\{(x, y) \in \mathbb{R}^2 : x = 0, 1 \leq y \leq 3\}$  e  $M = 3e^3$  assunto su  $\{(x, y) \in \mathbb{R}^2 : xy = 3, 1 \leq y \leq 3\}$

6.  $\gamma(t) = [-6 \cos t + 7]\vec{i} - 6[\sin t - 1]\vec{j}$ .

7.  $\alpha = 6$ .

8.  $216\pi$

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#### COMPITO 6

1.  $13 \arctan^2 \sqrt{x-1}$

2.  $e^{-36} - 1$

3.  $A_\alpha = \{(x, y) \in \mathbb{R}^2 : 0 \leq x^2 + y^2 < \alpha\}$  se  $\alpha < 6$ ,  $A_\alpha = \mathbb{R}^2 \setminus \{(0, 0)\}$  se  $\alpha = 6$ ,  $A_\alpha = \{(x, y) \in \mathbb{R}^2 : \alpha - 6 < x^2 + y^2 < \alpha\}$  se  $\alpha > 6$ .

4.  $(\pm 7, 0)$  minimi,  $(0, 0)$  sella.

5.  $m = 0$  assunto su  $\{(x, y) \in \mathbb{R}^2 : x = 0, 1 \leq y \leq 2\}$  e  $M = 2e^2$  assunto su  $\{(x, y) \in \mathbb{R}^2 : xy = 2, 1 \leq y \leq 2\}$
  6.  $\gamma(t) = [-7 \cos t + 8]\vec{i} - 7[\sin t - 1]\vec{j}$ .
  7.  $\alpha = 7$ .
  8.  $343\pi$
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