

Prova scritta #1 del 20.1.2020 – test

soluzioni

A.

1. ( 9 crediti )  $e^2$     1. ( 12 crediti )  $x < 0$

2.  $\frac{16\sqrt{2}\pi}{3}$  ;  $\int_0^2 2\pi x \sqrt{8-2x^2} dx$  ;  $-\frac{\pi}{3} (8-2x^2)^{3/2}$

3.  $c_1 \cos 2x + c_2 \sin 2x + (2 \cos x + \sin x) e^x / 10$

4.  $-64$

5. C.E.  $[0, +\infty) - \{4\}$     Imm  $(-\infty, -2) \cup [3/2, +\infty)$

6. (i)  $\forall x \in A, f(x) \leq L$  ; (ii)  $\forall \varepsilon > 0, \exists \bar{x} \in A : f(\bar{x}) > L - \varepsilon$

B.

1. ( 9 crediti )  $0$     1. ( 12 crediti )  $x > 0$

2.  $\sqrt{2}\pi$  ;  $\int_0^{1/2} 2\pi x \sqrt{2-8x^2} dx$  ;  $-\frac{\pi}{2} (2-8x^2)^{3/2}$

3.  $c_1 \cos 2x + c_2 \sin 2x + (2 \sin x - \cos x) e^x / 10$

4.  $-64$

5. C.E.  $[0, +\infty) - \{1\}$     Imm  $(-\infty, -4) \cup [3, +\infty)$

6. (i)  $\forall x \in A, f(x) \geq 1$  ; (ii)  $\forall \varepsilon > 0, \exists \bar{x} \in A : f(\bar{x}) < 1 + \varepsilon$

C.

1. ( 9 crediti )  $e$                                       1. ( 12 crediti )  $x > 0$

2.  $6\pi$  ;  $\int_0^{\sqrt{3}} 2\pi x \sqrt{9-3x^2} dx$  ;  $-\frac{2\pi}{9} (9-3x^2)^{3/2}$

3.  $c_1 \cos x + c_2 \sin x + (2 \sin 2x - \cos x) e^x / 10$

4. 16

5. C.E.  $[0, +\infty) - \{9\}$                                       Imm  $(-\infty, -1) \cup [1/3, +\infty)$

6. (i)  $\forall x \in A, f(x) \leq M$  ; (ii)  $\exists \bar{x} \in A : f(\bar{x}) = M$

D.

1. ( 9 crediti )  $0$                                       1. ( 12 crediti )  $x > 0$

2.  $\frac{\sqrt{3}\pi}{3}$  ;  $\int_0^{1/\sqrt{3}} 2\pi x \sqrt{3-9x^2} dx$  ;  $-\frac{\pi}{8} (3-9x^2)^{3/2}$

3.  $c_1 \cos x + c_2 \sin x - (2 \cos 2x + \sin 2x) e^x / 10$

4. 16

5. C.E.  $[0, +\infty) - \{9/4\}$                                       Imm  $(-\infty, -1) \cup [1/3, +\infty)$

6. (i)  $\forall x \in A, f(x) \geq m$  ; (ii)  $\exists \bar{x} \in A : f(\bar{x}) = m$