

# CORSO DI MATEMATICA GENERALE

## Esercitazione 2 - Soluzioni ed Errata Corrige

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### 1 Funzioni di una variabile reale: definizioni e proprietà

1. (a)  $D = \mathbb{R} \setminus \{3\}$ ,  $Im = (-\infty, 1)$ ,  $\inf = -\infty$ ,  $\max = 1$ , non iniettiva, non suriettiva.  
(b)  $D = \mathbb{R} \setminus \{-2, 0, 2\}$ ,  $Im = \mathbb{R} \setminus \{0\}$ ,  $\inf = -\infty$ ,  $\sup = +\infty$ , non iniettiva, non suriettiva.  
(c)  $D = \mathbb{R} \setminus \{3\}$ ,  $Im = \mathbb{R} \setminus \{2\}$ ,  $\inf = -\infty$ ,  $\sup = +\infty$ , iniettiva, non suriettiva.  
(d)  $D = \mathbb{R} \setminus [-1, 1)$ ,  $Im = (0, 1) \cup (1, +\infty)$ ,  $\min = 0$ ,  $\sup = +\infty$ , iniettiva, non suriettiva.
2. (a) No.  $f_1 : \mathbb{N} \rightarrow \mathbb{Q}$  o  $f_1 : \{n \in \mathbb{N}, \text{dispari}\} \rightarrow \mathbb{N}$   
(b) Si.  
(c) No.  $f_3 : \mathbb{Z} \setminus \{0, 1\} \rightarrow \mathbb{N}$  o  $f_3 : \mathbb{Z} \rightarrow \mathbb{N} \cup \{0\}$   
(d) Si.  
(e) No.  $f : \mathbb{R} \rightarrow \mathbb{R}^+$  o  $f : \mathbb{R} \rightarrow \mathbb{R}^-$
3. Si.
4. (a) Non iniettiva, non suriettiva.  
(b) Vero.  
(c)  $A = (-\infty, -1)$ .  $B = f(A) = (0, +\infty)$ .  $g(y) = \frac{-2-\sqrt{y}}{2}$ ,  $h(y) = \frac{-2+\sqrt{y}}{2}$ .
5. (a)  $g \circ f : \mathbb{N} \rightarrow \mathbb{R}$ ,  $g(f(n)) = n + 3$ ,  $Im(g \circ f) = \mathbb{N} \setminus \{1, 2, 3\}$   
(b)  $g \circ f : (-\infty, -3] \cup [1, +\infty) \rightarrow \mathbb{R}$ ,  $g(f(x)) = \sqrt{x^2 + 2x - 3}$ ,  $Im(g \circ f) = [0, +\infty)$   
(c)  $g \circ f : \mathbb{R} \setminus \{-\frac{7}{6}\} \rightarrow \mathbb{R}$ ,  $g(f(x)) = \frac{1}{6x+7}$ ,  $Im(g \circ f) = \mathbb{R} \setminus \{0\}$

### 2 Equazione della retta

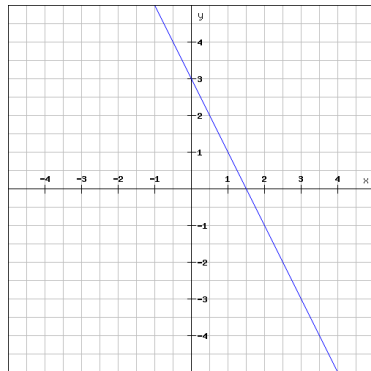
6. (a)  $x = \frac{1}{3}y + \frac{2}{3}$   
(b)  $x = y + 7$   
(c)  $x = \frac{1}{3}y - \frac{\sqrt{2}}{3}$   
(d)  $y = 3x + 2$   
(e)  $y = \frac{\sqrt{5}}{5}x - \frac{3\sqrt{5}}{5}$   
(f)  $y = 4x - 8$
7. (a)  $y = -2x + 2$   
(b)  $y = -x - 1$

(c)  $2x + 3y + 4 = 0$

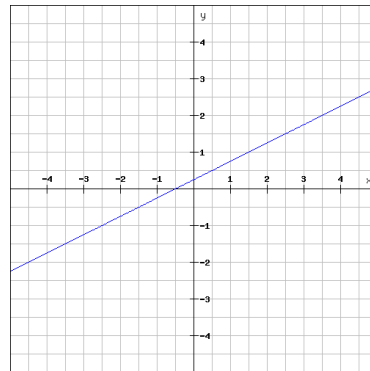
(d)  $y = \frac{2}{5}x + \frac{3}{5}$

(e)  $y = -\frac{1}{2}x + \frac{1}{2}$

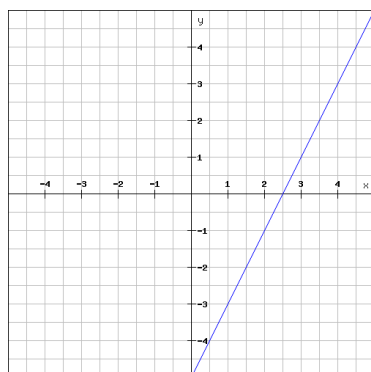
8.



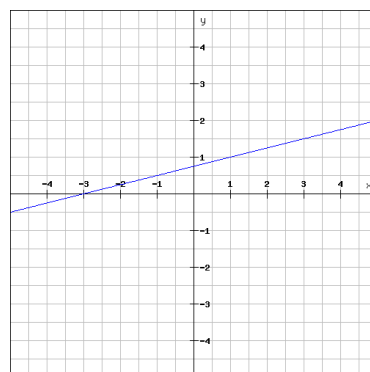
(a)



(b)



(c)



(d)

9. (a) Vero.

(b) Falso.

(c) Vero.

(d) Vero.

(e) Falso.