

1. $x \geq 3$ 2. $x \neq 1, 2$ 3. $(-\infty, -2) \cup \left[\frac{1}{2}, +\infty\right)$ 4. $|x| > \sqrt{3}$

5. $x \neq 2$ 6. $\bigcup_{k \in \mathbb{Z}} \left[2k\pi - \frac{\pi}{6}, 2k\pi + \frac{7\pi}{6}\right]$ 7. $x < 0$ 8. $(-\infty, -1] \cup \left[\frac{1}{3}, +\infty\right)$

9. $x \neq \pm \frac{\pi}{2}, \pm \frac{\pi}{4}, \pm \frac{3\pi}{4}, -\frac{\pi}{8}, \frac{3\pi}{8}, -\frac{5\pi}{8}, \frac{7\pi}{8}$

10. $[3, 4]$ 11. $\bigcup_{k \in \mathbb{Z}} \left(2k\pi, 2k\pi + \frac{\pi}{2}\right)$ 12. $x \geq -1$ 13. $x \leq -\frac{1}{2}$

14. $x > -\frac{1}{2}$ 15. $x \neq 2$ 16. $\emptyset$ 17. $\left(\frac{2}{3}, 2\right)$

18. $\left(-\infty, -\frac{\pi}{\pi-1}\right) \cup \bigcup_{k=1}^{\infty} \left(-\frac{2k\pi}{2k\pi-1}, -\frac{(2k+1)\pi}{(2k+1)\pi-1}\right) \cup \bigcup_{h=1}^{\infty} \left(-\frac{2h\pi}{2h\pi+1}, -\frac{(2h-1)\pi}{(2h-1)\pi+1}\right) \cup (0, +\infty)$

19. $x \neq 1$ 20. $x > 0, x \neq k\pi, k \in \mathbb{N}$

21. L'insieme di definizione è $\emptyset$

$\left\{\frac{1}{2}\right\}$

$\left[\frac{1-\alpha\sqrt{2-\alpha}}{2}, \frac{1+\alpha\sqrt{2-\alpha}}{2}\right]$
[0, 1]

se $\alpha > \sqrt{2}$

se $\alpha = \sqrt{2}$

se $1 < \alpha < \sqrt{2}$

se $0 < \alpha \leq 1$

22. $\frac{1}{2} \leq x \leq \frac{5}{9}$

23. $y < 0$

24. $\left(1, \frac{5}{3}\right]$

25. $\left[\frac{5}{3}, +\infty\right)$

26. $\left(-\infty, -\frac{5}{3}\right)$

27. $(0, +\infty)$

28. $y \geq 2$

29. $(-\infty, 0)$

30. $\left[\frac{3}{4}, +\infty\right)$

31. $\{n \in \mathbb{N} : 0 \leq n \leq 12\}$

32. $\bigcup_{n \in \mathbb{Z}} [2n, 2n+1)$

33. $[0, 4]$

34. $[0, 2)$

35. $[1, e]$

36. $[-1, 0]$

37. $(-1, 1)$

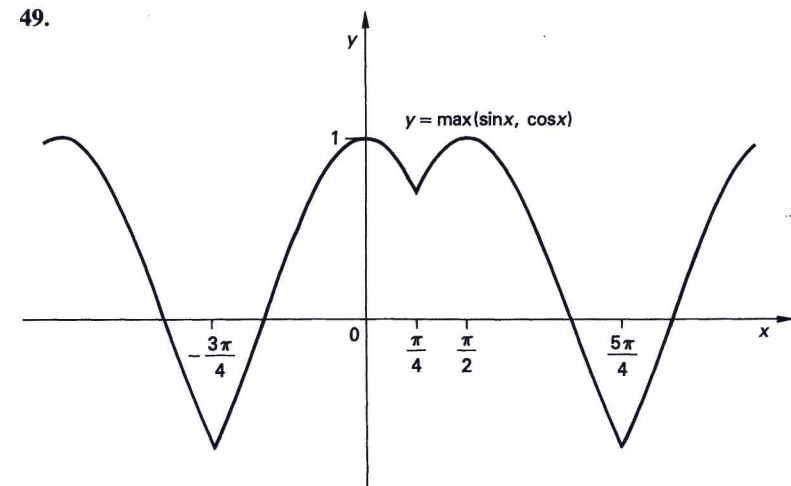
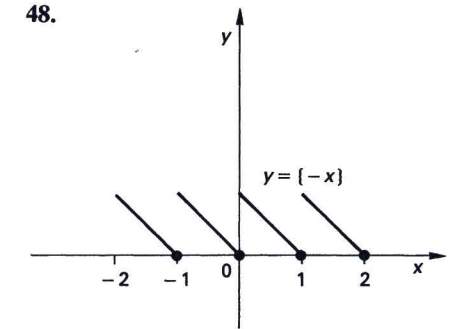
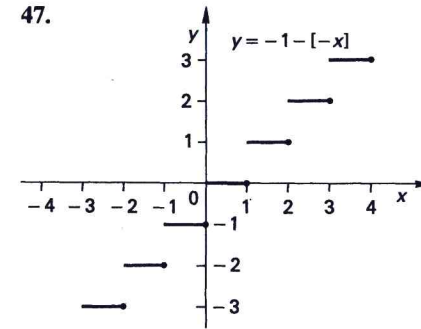
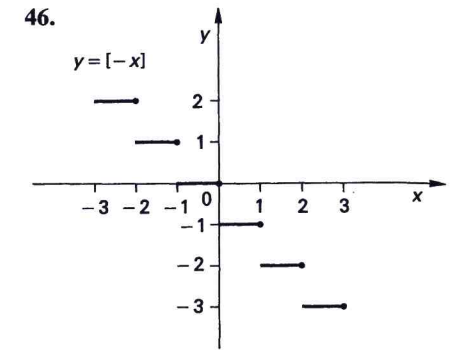
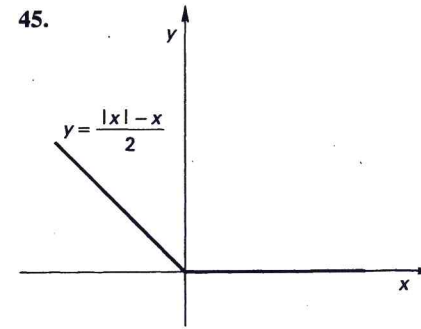
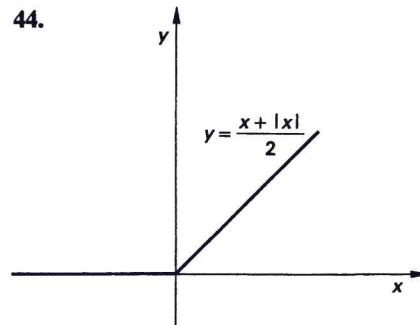
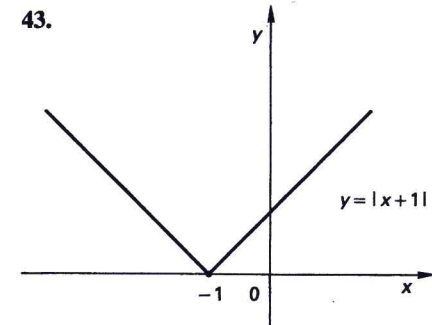
38. $(-1, 0]$

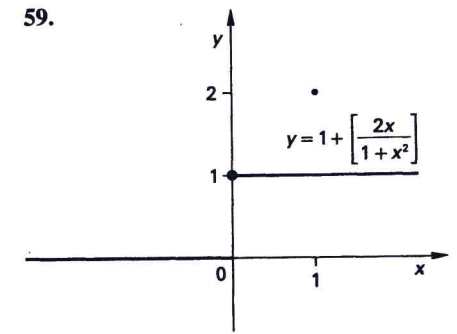
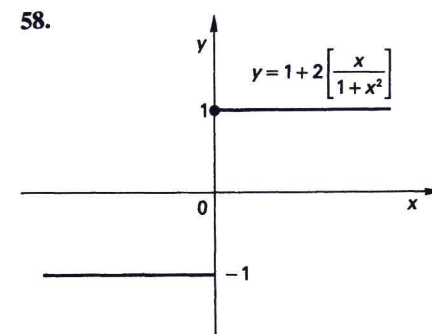
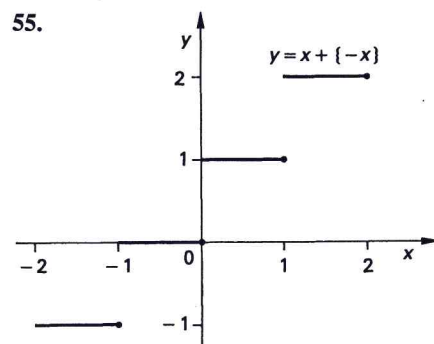
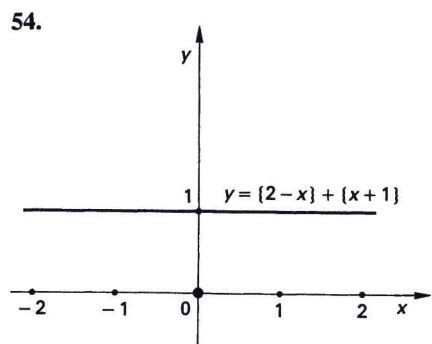
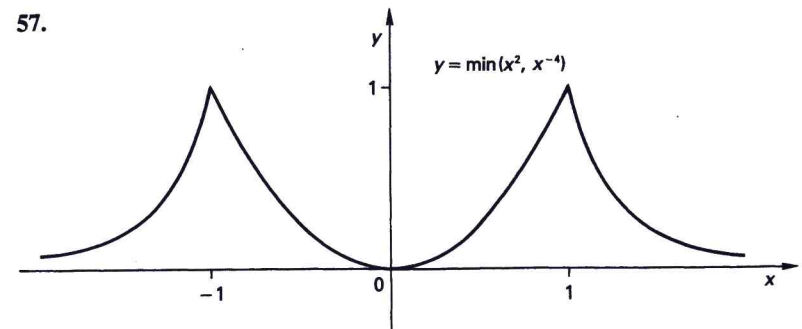
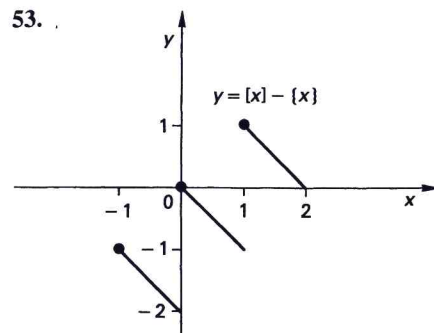
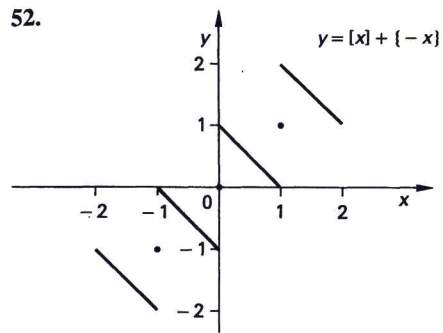
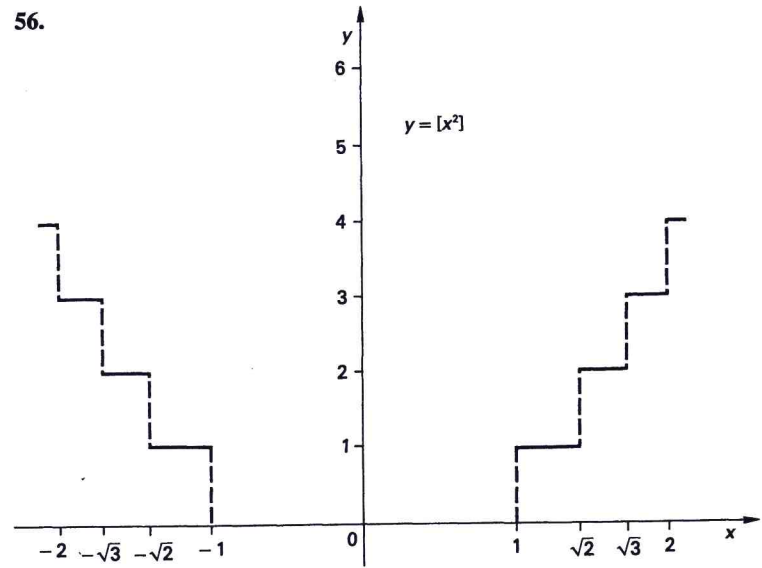
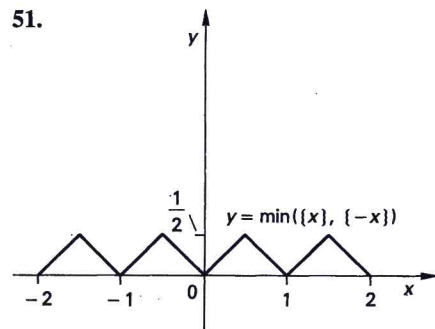
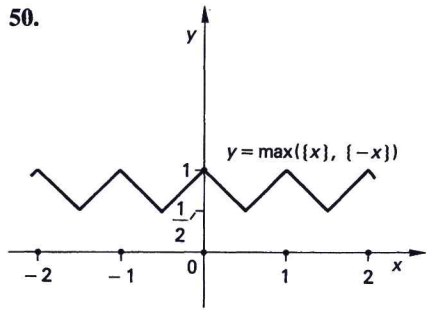
39. $(-3, -1] \cup [0, 2)$

40. $\left\{\frac{3}{2}\right\}$

41. $\emptyset$

42. $(-1, +\infty)$





$$60. \mathbb{R} - \left\{ -\frac{5}{2} \right\}; \frac{3x^2 + x - 4}{(2x + 5)^2}$$

$$61. x < 3; \sqrt{1 - \left(\frac{x^2 + 1}{x - 3} \right)^3}$$

$$62. (-\infty, 1) \cup (3, +\infty); \ln \left(1 - \frac{4x}{x^2 + 3} \right)$$

$$63. \left[\frac{1 - \sqrt{5}}{2}, 0 \right) \cup \left[\frac{\sqrt{5} + 1}{2}, +\infty \right); \sqrt{\ln \frac{x^2 - 1}{x}}$$

$$64. \emptyset$$

$$65. \bigcup_{k \in \mathbb{Z}} [2k\pi, (2k + 1)\pi]; \sqrt{e^{\sin x} - 1}$$

$$66. \mathbb{R}; e^{2(x^2 + 1)}$$

$$67. \mathbb{R}; \sin \sin x$$

$$68. x \geq 1$$

$$69. (-\infty, -2] \cup (0, +\infty)$$

$$70. \sqrt{3} < |x| \leq 2$$

$$71. [0, 1)$$

$$72. x \geq -1, x \neq 0$$

$$73. x \geq 0$$

$$74. [-1, 1 - \sqrt{2}] \cup [1, 1 + \sqrt{2}]$$

$$75. (68) \frac{3 + \cos x}{1 - \cos x}; \text{ sì}$$

$$(69) \frac{2}{\lg x^2 - 1}; \text{ no}$$

(70) Non invertibile

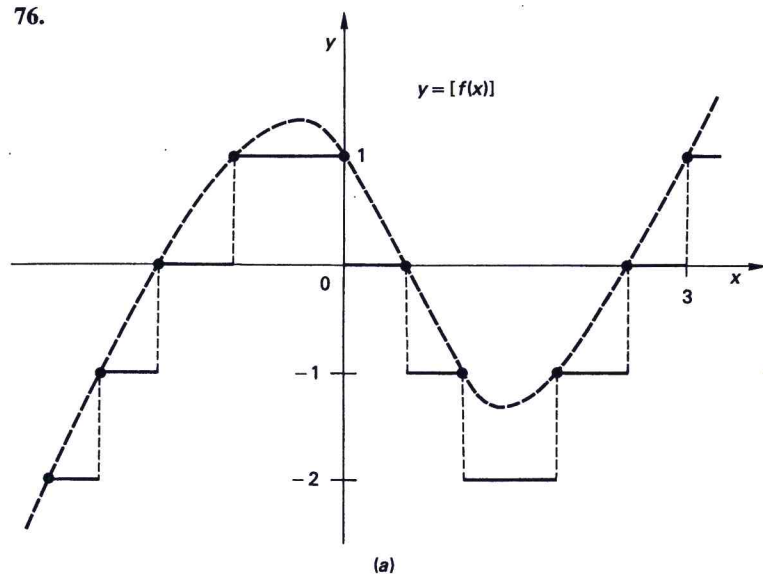
(71) Non invertibile

$$(72) f^{-1}(x) = \begin{cases} -2 \frac{\sqrt{1 + x^2} - 1}{x^2} & x < 0 \\ -1 & x = 0 \text{ No} \\ 2 \frac{\sqrt{1 + x^2} + 1}{x^2} & x > 0 \end{cases}$$

$$(73) x^{\ln x} - 1; \text{ sì}$$

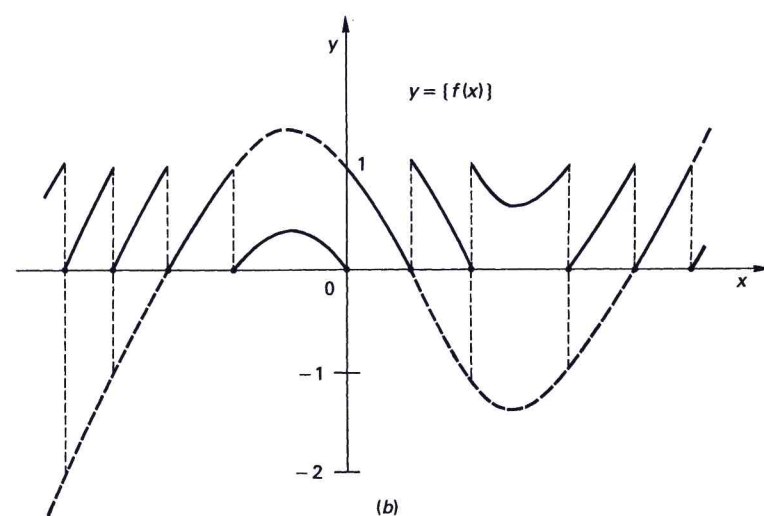
(74) Non invertibile

76.



(a)

(segue)



(b)

77. La restrizione di $\tan x$ all'intervallo $\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$; sì 78. $\{-x\} - [-x]$; no 79. $[x] + \{-x\}$; no

$$80. \frac{1}{2}(x + \{x\}) \left\{ x \in \bigcup_{k \in \mathbb{Z}} [2k, 2k + 1) \right\}; \text{ sì} \quad 81. \text{ Non invertibile}$$

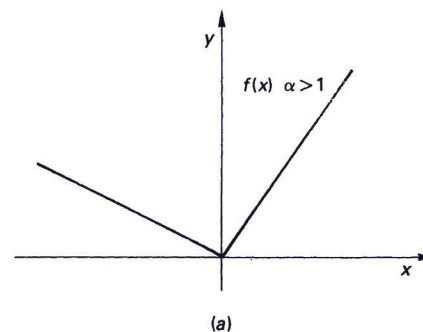
$$82. \frac{\alpha + \beta x}{1 - x}; \text{ no}$$

$$83. \frac{1}{x}; \text{ no}$$

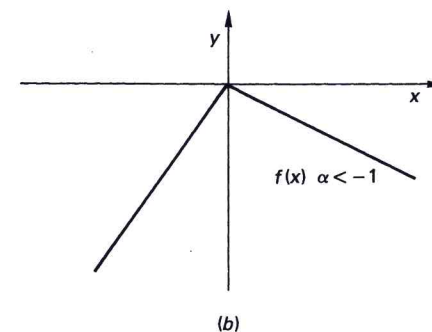
$$84. \frac{2}{3}x - \frac{1}{3}|x|; \text{ sì}$$

85. La funzione è invertibile in ogni intervallo $[\alpha, \beta] \subset (-\infty, 1]$, e in ogni intervallo $[\alpha, \beta] \subset [1, +\infty)$. L'immagine $f([\alpha, \beta])$ è contenuta in $(-\infty, 1]$. Risulta $f^{-1}(x) = 1 - \sqrt{1 - x}$ se $[\alpha, \beta] \subset (-\infty, 1]$, e $f^{-1}(x) = 1 + \sqrt{1 - x}$ se $[\alpha, \beta] \subset [1, +\infty)$.

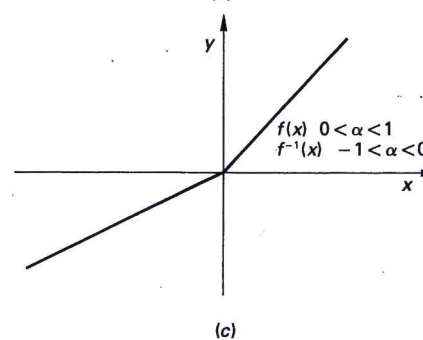
86. La funzione è invertibile per $|\alpha| < 1$, e risulta $f^{-1}(x) = \frac{y - \alpha|x|}{1 - \alpha^2}$.



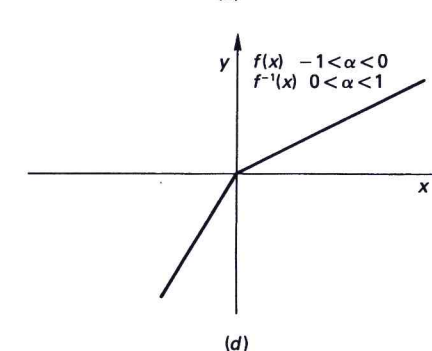
(a)



(b)



(c)



(d)