

Esercizio 1. Dire se i seguenti rappresentano grafici di funzioni crescenti o decrescenti.

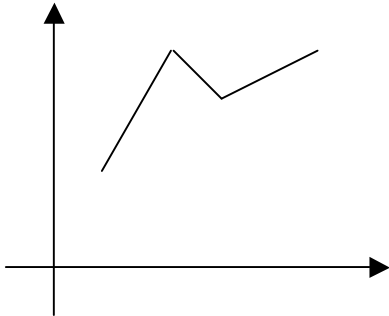


Figura 1

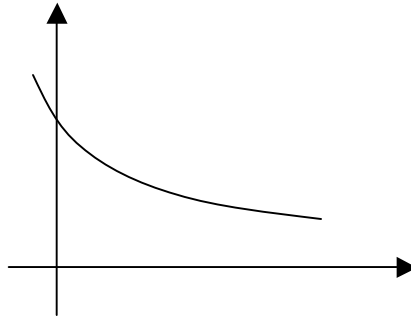


Figura 2

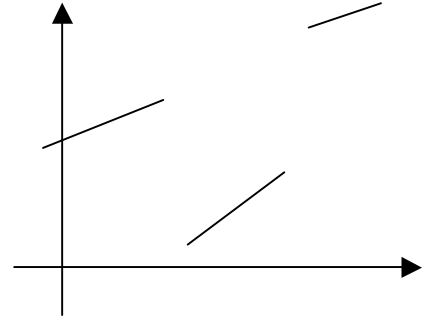


Figura 3

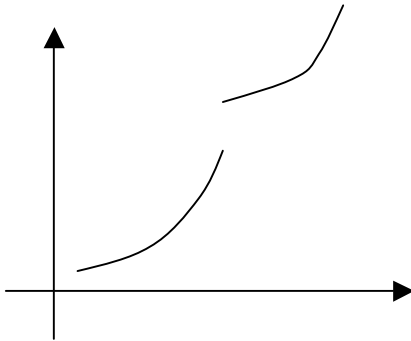


Figura 4

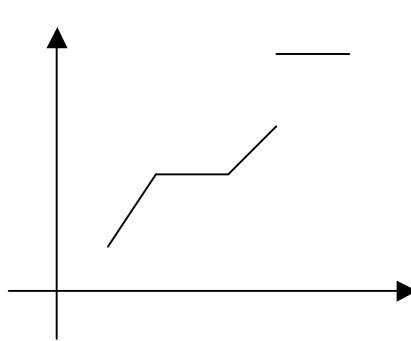


Figura 5

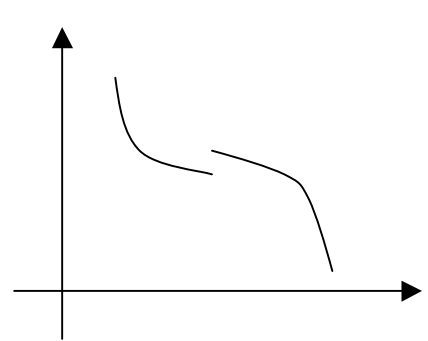


Figura 6

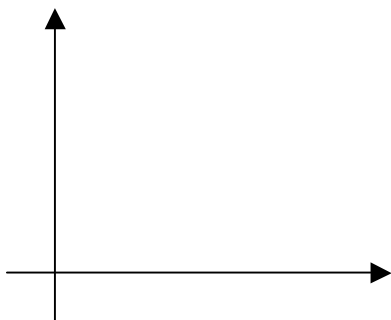
Esercizio 2. Scomporre le seguenti funzioni in funzioni elementari (potenze, polinomi, esponenziali, logaritmi, seno, ...)

$$\begin{aligned} f_1(x) &= \frac{1}{x^2 + 5}, & f_2(x) &= \sin(2x + 5), & f_3(x) &= \sqrt{1 + 3x^2}, \\ f_4(x) &= \left(\frac{1}{x-1}\right)^2 + 2, & f_5(x) &= 3^{7x+1}, & f_6(x) &= 3 \log^2 x - 1, \end{aligned}$$

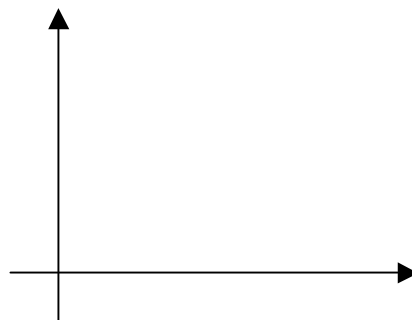
Esercizio 3. Dire per ognuna delle sottoelencate, di che tipo di funzioni si tratta (funzioni lineari, parabole, polinomi, funzioni razionali, iperboli, esponenziali, ...). N.B.: tutte le variabili non definite si pensano costanti.

$$\begin{aligned} g_1(x) &= 5x - 7 - x^2, & g_2(z) &= 5 + 2z, & g_3(y) &= \frac{12}{3 - 2y}, \\ g_4(w) &= \frac{1}{3^w}, & g_5(t) &= \frac{2t^3 - t + 1}{2t^2 + 7}, & g_6(x) &= xy^2 + 1, \\ g_7(y) &= xy^2 + 3, & g_8(z) &= \frac{z + 2x^2}{3z + 1}, & g_9(x) &= \frac{z + 2x^2}{3z + 1}, \\ g_{10}(y) &= y^{3z}, & g_{11}(z) &= (2y)^z, & g_{12}(t) &= x^2 + y^2x + 7. \end{aligned}$$

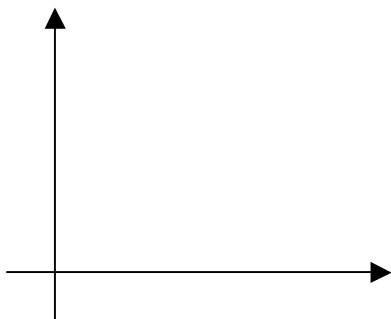
Esercizio 4. Rappresentare qualitativamente il grafico delle seguenti funzioni



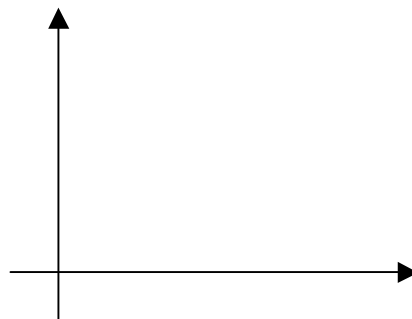
$$h_1(x) = 2x^2 - 4x + 1$$



$$h_2(t) = 4t - t^2 + 3$$



$$h_3(x) = \frac{2x + 1}{x - 3}$$



$$h_4(y) = \frac{y - 4}{2y - 1}$$