

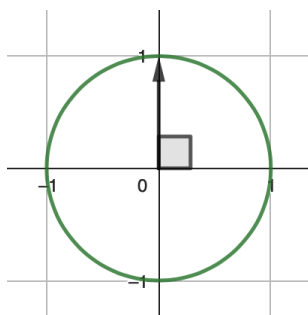
Le funzioni trascendenti - Soluzioni

Chiara Spagnoli

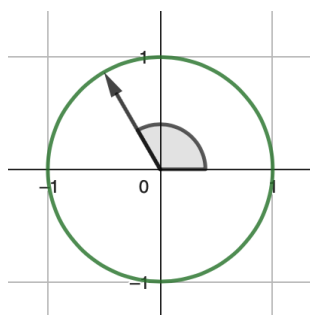
1 Gradi vs Radianti

Esercizio 1.1 .

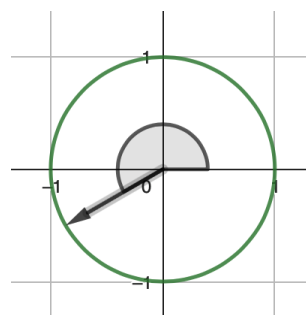
a) $\alpha_1 = \frac{\pi}{2}$



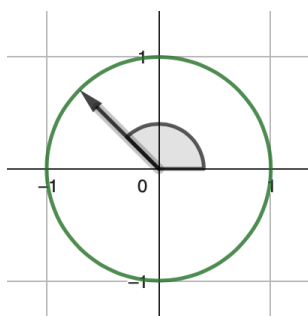
b) $\alpha_2 = \frac{2\pi}{3}$



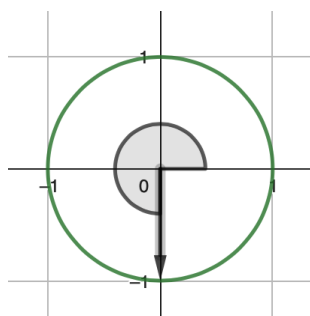
c) $\alpha_3 = \frac{7\pi}{6}$



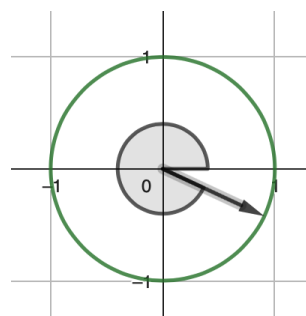
d) $\alpha_4 = \frac{3\pi}{4}$



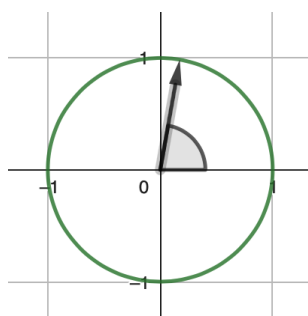
e) $\alpha_5 = \frac{3\pi}{2}$



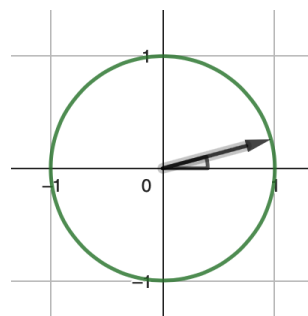
f) $\alpha_6 = \frac{67\pi}{36}$



g) $\alpha_7 = \frac{40\pi}{9}$

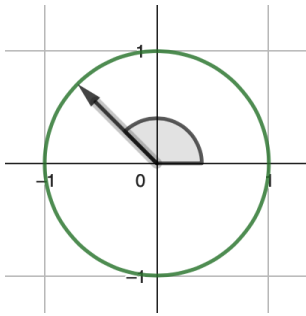


h) $\alpha_8 = \frac{\pi}{12}$

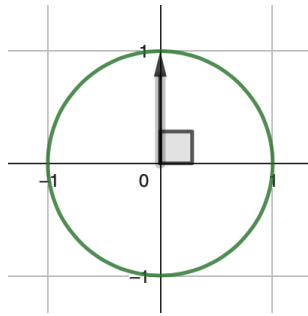


Esercizio 1.2 .

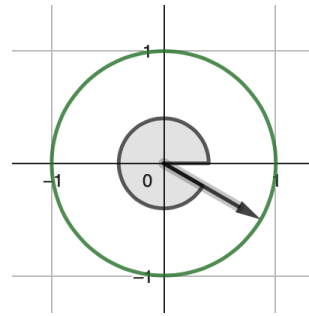
a) $\alpha_1 = 135^\circ$



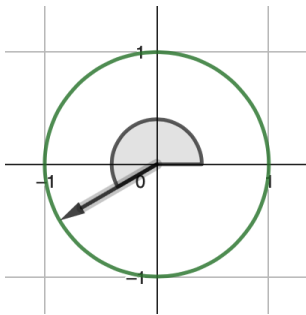
b) $\alpha_2 = 90^\circ$



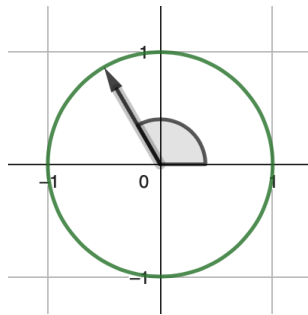
c) $\alpha_3 = 330^\circ$



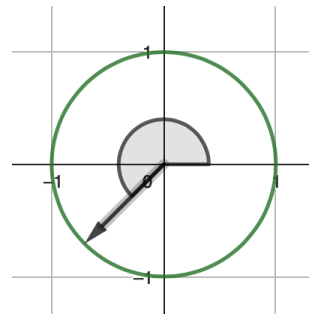
d) $\alpha_4 = 210^\circ$



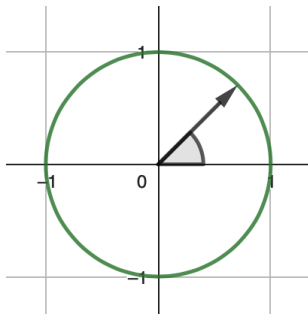
e) $\alpha_5 = 120^\circ$



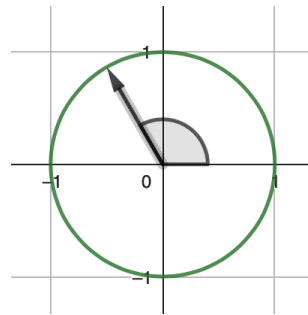
f) $\alpha_6 = 225^\circ$



g) $\alpha_7 = 45^\circ$



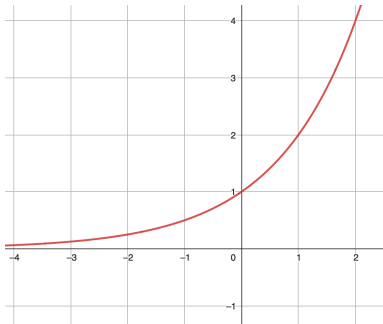
h) $\alpha_1 = 4800^\circ$



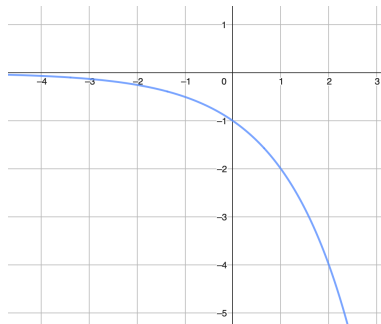
2 Funzioni esponenziali, logaritmiche e trigonometriche: i grafici

Esercizio 2.1 .

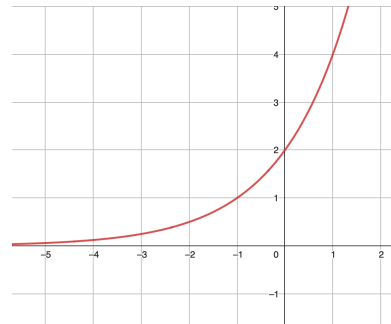
a) $y = 2^x$



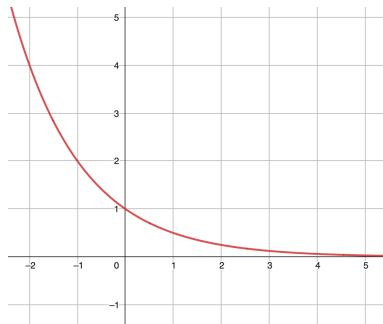
b) $y = -2^x$



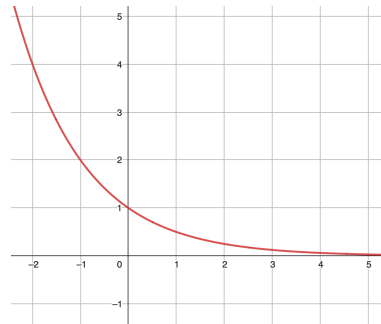
c) $y = 2^{x+1}$



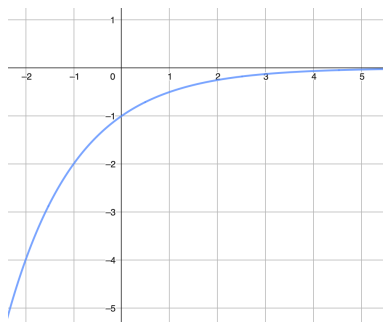
d) $y = \left(\frac{1}{2}\right)^x$



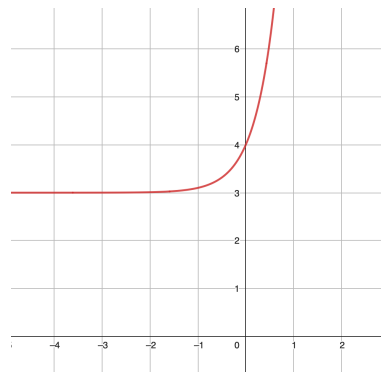
e) $y = \frac{1}{2^x}$



f) $y = -\left(\frac{1}{2}\right)^x$

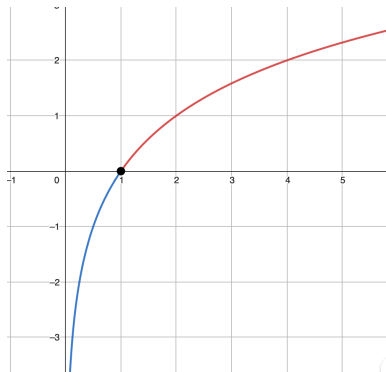


g) $y = 10^x + 3$

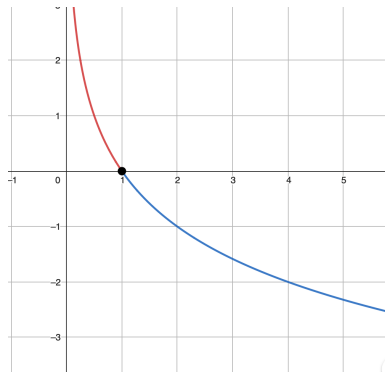


Esercizio 2.2 .

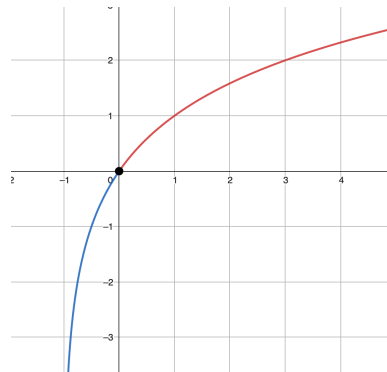
a) $y = \log_2(x)$



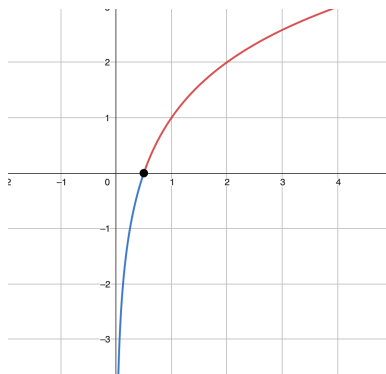
b) $y = -\log_2(x)$



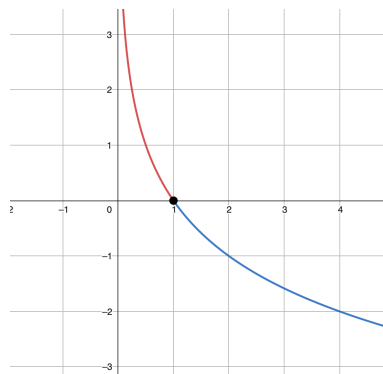
c) $y = \log_2(x + 1)$



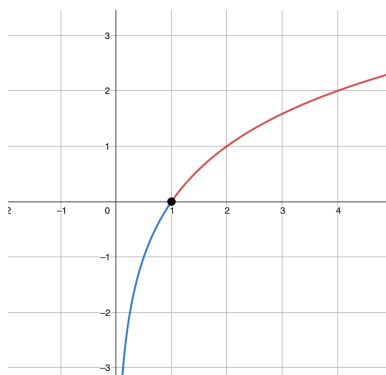
d) $y = \log_2(x) + 1$



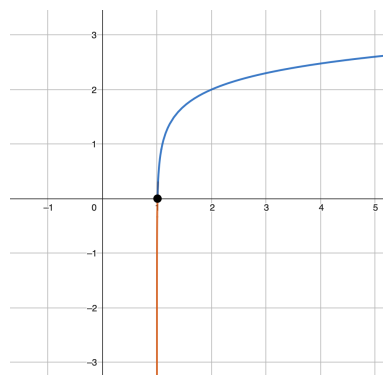
e) $y = \log_{1/2}(x)$



f) $y = -\log_{1/2}(x)$



g) $y = \log(x - 1) + 2$



Esercizio 2.3 .

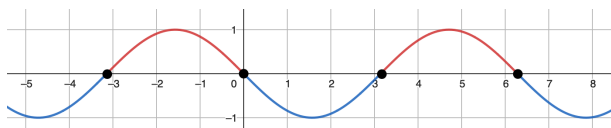
a) $y = \cos(x)$



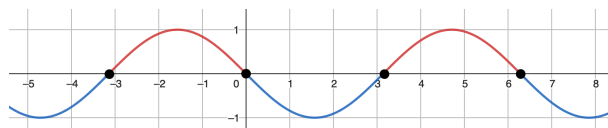
b) $y = \sin(x)$



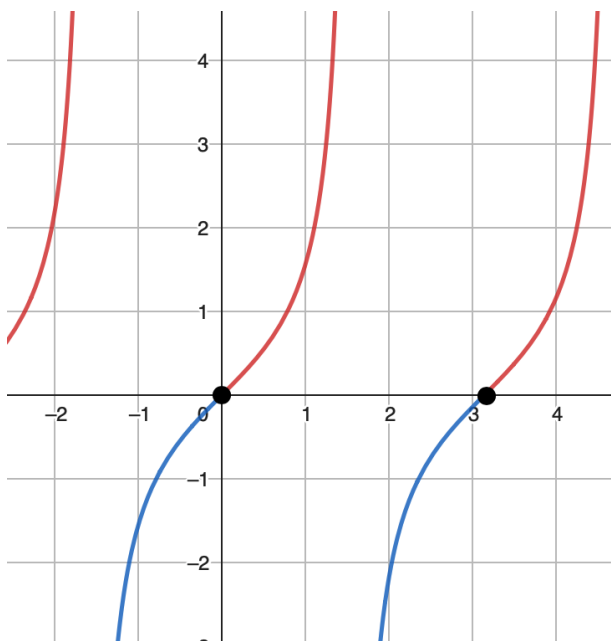
d) $y = \cos(x + \pi/2)$



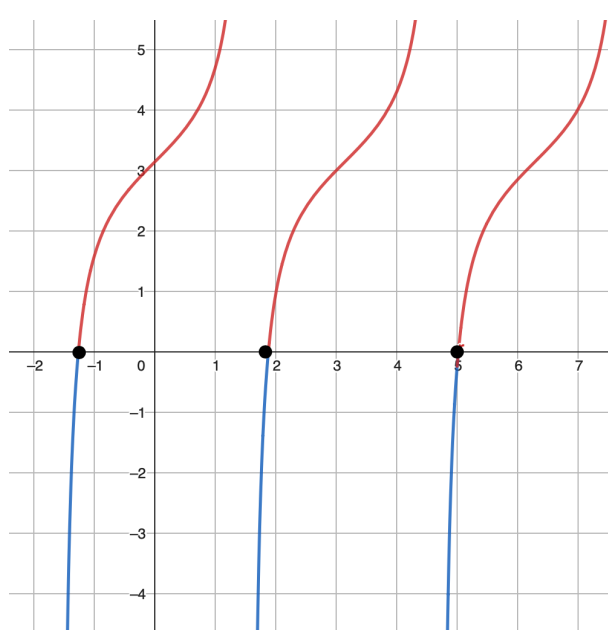
e) $y = -\sin(x)$



c) $y = \tan(x)$



f) $y = \tan(x) + \pi$



3 Conti e proprietà

Esercizio 3.1

- a) -1
- b) -2
- c) 10
- d) 1
- e) 2
- f) l'espressione non ha significato
- g) l'espressione non ha significato
- h) $\sqrt{2}$
- i) $-\frac{1}{4}$
- j) 0
- k) l'espressione non ha significato

Esercizio 3.3

- a) 0
- b) $\sqrt{2}$
- c) 10
- d) -4
- e) -1
- f) 2

Esercizio 3.2

- a) $\log_1 8$
- b) 64
- c) 2
- d) 0
- e) 3
- f) 1
- g) $\log(8)$
- h) 25
- i) $\log_5(8)$

Esercizio 3.4

- a) $\frac{\sqrt{3}}{2} \cos(x) + \frac{1}{2} \sin(x)$
- b) $\frac{1}{2} \cos(x) - \frac{\sqrt{3}}{2} \sin(x)$
- c) $-\frac{\sqrt{2}}{2} \cos^2(x) + \sqrt{2} \cos(x) \sin(x) + \frac{\sqrt{2}}{2} \sin^2(x)$
- d) $\frac{\sqrt{2}}{2} \cos^2(x) - \frac{\sqrt{2}}{2} \sin^2(x) + \sqrt{2} \cos(x) \sin(x)$
- e) $\frac{1+\sqrt{3}}{2\sqrt{2}}$
- f) $-\frac{1}{2}$
- g) $-\frac{\sqrt{3}}{2}$

4 Equazioni esponenziali, logaritmiche e trigonometriche

Esercizio 4.1

- a) $x = \log_2(3)$
- b) $x = -2$
- c) $x = \frac{1}{2}$
- d) $x = 0$
- e) $x = \frac{1}{4}$
- f) imp.
- g) $x = -1$
- h) $x = -4$
- i) $x = \frac{9}{5}$

Esercizio 4.2

- a) $x = 8$
- b) $x = -\frac{1}{e^2}$
- c) $x = 2 + \sqrt{2}$
- d) $x = \pm 2\sqrt{3}$
- e) $1 + \sqrt{11}$
- f) imp.
- g) $x = 4$
- h) $x = -1$
- i) $x = e^{-1} \vee x = e^2$

Esercizio 4.3

- a) $x = \pm \frac{\pi}{3} + k2\pi$
- b) $x = \frac{\pi}{3} + k2\pi \vee x = \frac{2\pi}{3} + k2\pi$
- c) imp.
- d) $x = \frac{\pi}{12} + k2\pi \vee x = \frac{7\pi}{12} + k2\pi$
- e) $x = \frac{\pi}{3} + k2\pi \vee x = \frac{2\pi}{3} + k2\pi \vee x = \frac{\pi}{4} + k2\pi \vee x = \frac{3\pi}{4} + k2\pi$
- f) $x = k\pi \vee x = \frac{3\pi}{2} + k2\pi$
- g) $x = k\pi \vee x = \frac{3\pi}{2} + k\pi$
- h) $x = \frac{3\pi}{2} + 2k\pi \vee x = 2k\pi$

5 Esercizi a crocette

Esercizio 5.1 Le soluzioni dell'equazione $\log_3(x^3) + \log_3^3(x) = 0$:

(B) $x = 1$

Esercizio 5.2 Per quali $a \in \mathbb{R}$ è vera l'uguaglianza $\cos(x + \pi) = \sin(x + a)$:

(C) $a = -\frac{\pi}{4} \pm 2k\pi$

Esercizio 5.3 L'angolo $\alpha = \frac{11}{3}\pi$ vale:

(A) 660°

Esercizio 5.4 Le soluzioni dell'equazione $10^{(x-2)} \cdot 10^{(x+2)} = 100$ sono:

(B) $x = 1$

Esercizio 5.5 Le soluzioni dell'equazione $\sin(x + \frac{\pi}{5}) = \frac{1}{2}$ con $x \in [0; 2\pi]$ sono :

(A) $x = \frac{29}{30}\pi \vee x = \frac{19}{30}\pi$

Esercizio 5.6 Le soluzioni dell'equazione $\log_3(x + 2) + \log_3(x - 2) = 2$ sono :

(C) $x = \sqrt{13}$

Esercizio 5.7 Le soluzioni dell'equazione $(3^{x+2})^{x-2} = \frac{1}{9}$ sono :

(B) $x = \pm\sqrt{2}$

Esercizio 5.8 Il valore minimo della funzione $y = \cos(x) + 3$ è :

(D) 2

Esercizio 5.9 L'espressione $\log(1 + (x - 2)^2)$ è equivalente a :

(D) nessuna delle precedenti

Esercizio 5.10 L'espressione $\cos(\frac{\pi}{2} + \frac{\pi}{3})$ vale :

(A) $-\frac{\sqrt{3}}{2}$

Esercizio 5.11 Le soluzioni dell'equazione $\log_{10}(100^x) = 12$ sono :

(D) $x = 6$

Esercizio 5.12 Una delle soluzioni di $\cos(x + \frac{\pi}{4}) = 0$ è:

(B) $x = \frac{\pi}{4}$

Esercizio 5.13 Il valore massimo della funzione $y = \sin(x + \frac{\pi}{3})$ è :

(A) 1

Esercizio 5.14 L'espressione $10^{\log_{10}(x-3) + \log_{10}(x+3)}$ è equivalente a :

(A) $x^2 - 9$

Esercizio 5.15 Le soluzioni dell'equazione $100^x - 10^{x+1} + 1 = 0$ sono :

(B) $x = \log_{10}(5 \pm 2\sqrt{6})$

Esercizio 5.16 Le soluzioni dell'equazione $1^{10^4 + 8^{23}} = 10^x$ sono :

(B) $x = 0$