

## Funzioni Trigonometriche

Formule importanti:

$$\operatorname{sen}^2(\alpha) + \operatorname{cos}^2(\alpha) = 1, \quad \operatorname{tg}(\alpha) = \frac{\operatorname{sen}(\alpha)}{\operatorname{cos}(\alpha)}.$$

$$\begin{cases} \operatorname{sen}(\alpha + \beta) = \operatorname{sen}(\alpha) \operatorname{cos}(\beta) + \operatorname{cos}(\alpha) \operatorname{sen}(\beta); \\ \operatorname{sen}(\alpha - \beta) = \operatorname{sen}(\alpha) \operatorname{cos}(\beta) - \operatorname{cos}(\alpha) \operatorname{sen}(\beta); \\ \operatorname{cos}(\alpha + \beta) = \operatorname{cos}(\alpha) \operatorname{cos}(\beta) - \operatorname{sen}(\alpha) \operatorname{sen}(\beta); \\ \operatorname{cos}(\alpha - \beta) = \operatorname{cos}(\alpha) \operatorname{cos}(\beta) + \operatorname{sen}(\alpha) \operatorname{sen}(\beta). \end{cases}$$

$$\begin{cases} \operatorname{sen}(2\alpha) = 2\operatorname{sen}(\alpha) \operatorname{cos}(\alpha); \\ \operatorname{cos}(2\alpha) = \operatorname{cos}^2(\alpha) - \operatorname{sen}^2(\alpha) = 2\operatorname{cos}^2(\alpha) - 1 = 1 - 2\operatorname{sen}^2(\alpha). \end{cases}$$

Semplificare le seguenti espressioni:

1-4.  $\operatorname{cos}(\pi - \alpha)$ ,  $\operatorname{tg}(\pi + \alpha)$ ,  $\operatorname{sen}(2\pi - \alpha)$ ,  $\operatorname{cos}(-\alpha)$ ;

5-8.  $\operatorname{tg}(\pi - \alpha)$ ,  $\operatorname{cos}(3\pi - \alpha)$ ,  $\operatorname{sen}(\pi + \alpha)$ ,  $\operatorname{sen}(\pi - \alpha)$ ;

9-12.  $\operatorname{sen}(\frac{\pi}{2} - \alpha)$ ,  $\operatorname{cos}(\frac{\pi}{2} + \alpha)$ ,  $\operatorname{tg}(\frac{3\pi}{2} - \alpha)$ ,  $\operatorname{sen}(\frac{3\pi}{2} + \alpha)$ ;

13-16.  $\operatorname{sen}(\frac{\pi}{2} + \alpha)$ ,  $\operatorname{cos}(\frac{\pi}{2} - \alpha)$ ,  $\operatorname{tg}(\frac{3\pi}{2} + \alpha)$ ,  $\operatorname{sen}(\frac{3\pi}{2} - \alpha)$ ;

17-20.  $1 - \operatorname{sen}^2(\alpha)$ ,  $1 + \operatorname{tg}^2(\alpha)$ ,  $\frac{1}{\operatorname{tg}(\alpha)}$ ,  $\operatorname{cos}^2(\alpha) - 1$ .

Risolvere le seguenti equazioni:

21.  $\operatorname{sen}(x) = -\frac{1}{2}\sqrt{2}$ ,  $\operatorname{cos}(x) = \frac{1}{2}\sqrt{3}$ ,  $\operatorname{tg}(x) = -1$ ,  $\operatorname{sen}(x) = \frac{1}{2}$ ;

22.  $\operatorname{cos}(x) = -\frac{1}{2}$ ,  $\operatorname{cos}(x) = \frac{1}{2}\sqrt{2}$ ,  $\operatorname{tg}(x) = -\sqrt{3}$ ,  $\operatorname{cos}(x) = -\frac{1}{2}\sqrt{3}$ ;

23.  $\operatorname{tg}(x) = 0$ ,  $\operatorname{sen}(x) = -1$ ,  $\operatorname{cos}(x) = 0$ ,  $\operatorname{cos}(x) = -1$ ;

24.  $\operatorname{tg}(x) = \frac{1}{3}\sqrt{3}$ ,  $\operatorname{cotg}(x) = 1$ ,  $\operatorname{sen}(x) = -\frac{1}{2}$ ,  $\operatorname{cos}(x) = -\frac{1}{2}\sqrt{3}$ .

Tracciare i grafici delle seguenti funzioni:

25-28.  $\operatorname{sen}(x)$ ,  $\operatorname{cos}(x)$ ,  $\operatorname{tg}(x)$ ,  $\operatorname{cotg}(x)$ ;

29-32.  $\operatorname{sen}(2x)$ ,  $\operatorname{cos}(3x)$ ,  $\operatorname{tg}(x/2)$ ,  $\operatorname{tg}(\pi - x)$ ;

33-36.  $\operatorname{sen}(x + \frac{\pi}{4})$ ,  $\operatorname{cos}(\frac{\pi}{3} - x)$ ,  $\operatorname{cos}(x + \pi)$ ,  $\operatorname{tg}(\frac{\pi}{4} - x)$ ;

37-40.  $\operatorname{tg}(-2x)$ ,  $\operatorname{sen}(\pi - 2x)$ ,  $\operatorname{cos}(\pi + 3x)$ ,  $\operatorname{cos}(2x - \pi)$ .