Funzioni Trigonometriche

Formule importanti:

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

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

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

Semplificare le seguenti espressioni:

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

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

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

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

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

Risolvere le seguenti equazioni:

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

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

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

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

Tracciare i grafici delle seguenti funzioni:

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

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

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

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