

Zadatak 22. Iz dane vrijednosti jedne izračunaj vrijednosti ostalih trigonometrijskih funkcija:

- 1) $\sin x = \frac{5}{13}$, $\operatorname{tg} x < 0$;
- 2) $\cos x = -\frac{24}{25}$, $\operatorname{ctg} x < 0$;
- 3) $\operatorname{tg} x = 3\frac{15}{16}$, $\cos x > 0$;
- 4) $\operatorname{ctg} x = -2.4$, $\sin x < 0$.

Rješenje. 1) $\sin x = \frac{5}{13} > 0$, $\operatorname{tg} x < 0 \implies \cos x < 0$

$$\cos x = -\sqrt{1 - \sin^2 x} = -\sqrt{1 - \frac{25}{169}} = -\frac{12}{13}$$

$$\operatorname{tg} x = \frac{\sin x}{\cos x} = -\frac{5}{12}$$

$$\operatorname{ctg} x = \frac{1}{\operatorname{tg} x} = -\frac{12}{5}$$

2) $\cos x = -\frac{24}{25}$, $\operatorname{ctg} x < 0 \implies \sin x > 0$, $\operatorname{tg} x < 0$

$$\sin x = \sqrt{1 - \cos^2 x} = \sqrt{1 - \frac{576}{625}} = \sqrt{\frac{49}{625}} = \frac{7}{25}$$

$$\operatorname{tg} x = \frac{\sin x}{\cos x} = -\frac{7}{24}$$

$$\operatorname{ctg} x = \frac{1}{\operatorname{tg} x} = -\frac{24}{7}$$

3) $\operatorname{tg} x = 3\frac{15}{16}$, $\cos x > 0 \implies \sin x > 0$, $\operatorname{ctg} x > 0$

$$\operatorname{ctg} x = \frac{1}{\operatorname{tg} x} = \frac{16}{63}$$

$$\cos x = \sqrt{\frac{1}{1 + \operatorname{tg}^2 x}} = \sqrt{\frac{1}{1 + \frac{3969}{256}}} = \sqrt{\frac{1}{\frac{4225}{256}}} = \sqrt{\frac{256}{4225}} = \frac{16}{65}$$

$$\sin x = \sqrt{1 - \cos^2 x} = \sqrt{1 - \frac{256}{4225}} = \sqrt{\frac{3969}{4225}} = \frac{63}{65}$$

$$4) \operatorname{ctg} x = -2.4 = -\frac{24}{10} = -\frac{12}{5}, \sin x < 0 \implies \cos x > 0, \operatorname{tg} x < 0$$

$$\operatorname{tg} x = \frac{1}{\operatorname{ctg} x} = -\frac{5}{12}$$

$$\cos x = \sqrt{\frac{1}{1 + \operatorname{tg}^2 x}} = \sqrt{\frac{1}{1 + \frac{25}{144}}} = \sqrt{\frac{1}{\frac{169}{144}}} = \sqrt{\frac{144}{169}} = \frac{12}{13}$$

$$\sin x = -\sqrt{1 - \cos^2 x} = -\sqrt{1 - \frac{144}{169}} = -\sqrt{\frac{25}{169}} = -\frac{5}{13}$$