

## Zadaci za vježbu vezani uz drugu pisanu provjeru znanja

Zadatak 1: Ako je  $\cos\left(x + \frac{\pi}{3}\right) = \frac{3}{5}$ ,  $\frac{7\pi}{6} < x < \frac{5\pi}{3}$ , koliko je  $\cos x$ ?

Zadatak 2: Ako je  $\sin \alpha \cdot \sin \beta = 0.5$ ,  $\alpha - \beta = \frac{\pi}{2}$ , koliko je  $\cos(\alpha + \beta)$ ?

Zadatak 3: Ako je  $\sin\left(x - \frac{\pi}{6}\right) = \frac{4}{5}$ ,  $\frac{2\pi}{3} < x < \frac{7\pi}{6}$ , koliko je  $\sin x$ ?

Zadatak 4: Ako je  $\sin x = -0.8$ ,  $\frac{3\pi}{2} < x < 2\pi$ , koliko je  $\cos\left(\frac{\pi}{6} + x\right)$ ?

Zadatak 5: Ako je  $\cos x = -0.6$ ,  $\pi < x < \frac{3\pi}{2}$ , koliko je  $\sin\left(\frac{\pi}{3} - x\right)$ ?

Zadatak 6: Ako je  $\sin\left(\frac{\pi}{3} - \alpha\right) = -\frac{4}{5}$ ,  $-\frac{7\pi}{6} < x < -\frac{2\pi}{3}$ , koliko je  $\sin \alpha$ ?

Zadatak 7: Ako je  $\sin\left(\alpha - \frac{\pi}{6}\right) = \frac{4}{5}$ ,  $\frac{2\pi}{3} < x < \frac{7\pi}{6}$ , koliko je  $\sin \alpha$ ?

Zadatak 8: Ako je  $\sin x = -\frac{5}{13}$ ,  $\pi < x < \frac{3\pi}{2}$ , koliko je  $\operatorname{tg}\left(\frac{\pi}{4} - 2x\right)$ ?

Zadatak 9: Ako je  $\sin x = -\frac{15}{17}$ ,  $\frac{\pi}{2} < x < \pi$ , koliko je  $\operatorname{tg}\left(\frac{\pi}{4} + \frac{x}{2}\right)$ ?

Zadatak 10: Ako je  $\sin x + \cos x = \frac{1}{5}$ ,  $\frac{\pi}{2} < x < \frac{3\pi}{4}$ , koliko je  $\operatorname{tg} 2x$ ?

Zadatak 11: Ako je  $\sin\left(x - \frac{3\pi}{2}\right) = -\frac{4}{5}$ ,  $x \in \left\langle \frac{\pi}{2}, \pi \right\rangle$ , koliko je  $\sin \frac{x}{2} \cdot \cos \frac{x}{2}$ ?

Zadatak 12: Ako je  $\sin \frac{x}{2} - \cos \frac{x}{2} = \frac{1}{5}$ ,  $\frac{\pi}{2} < x < \pi$ , koliko je  $\operatorname{ctg} 2x$ ?

Zadatak 13: Koliko je  $\operatorname{tg} x$ , ako je  $\sin \frac{x}{2} = \frac{5}{13}$ , te  $x \in \left\langle \frac{3\pi}{2}, 2\pi \right\rangle$ ?

Zadatak 14: Ako je  $\sin \frac{\alpha}{2} = \frac{12}{13}$ , te  $\alpha \in \left\langle \frac{\pi}{2}, \pi \right\rangle$ , izračunaj  $\operatorname{ctg} \alpha$

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Zadatak 15\*: Ako je  $\operatorname{ctg}\left(\frac{3\pi}{2} - x\right) = \frac{4}{3}$ ,  $0 < x < \frac{\pi}{2}$ , koliko je  $\cos \frac{x}{2} \cdot \cos \frac{5x}{2}$ ?

Zadatak 16\*: Koliko je  $\operatorname{ctg} \frac{x}{2}$ , ako je  $\sin x - \cos x = \frac{1 + 2\sqrt{2}}{3}$ ?

Zadatak 17\*: Koliko je  $\operatorname{tg} \frac{x}{4}$ , ako je  $\cos x = -0.6$ , te  $\pi < x < \frac{3\pi}{2}$ ?

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Zadatak 18: Ako je  $\sin x + \cos x = m$ , koliko je  $\frac{1 - \cos 2x}{\operatorname{ctg} \frac{x}{2} - \operatorname{tg} \frac{x}{2}}$ ?

Zadatak 19: Ako je  $\cos(a + b) = \frac{1}{3}$ ,  $\cos(a - b) = \frac{1}{5}$ , koliko je  $\operatorname{tg} a \cdot \operatorname{tg} b$ ?

Zadatak 20: Ako je  $\alpha + \beta = \frac{3\pi}{4}$ , koliko je  $(1 + \operatorname{ctg} \alpha)(1 + \operatorname{ctg} \beta)$ ?

Zadatak 21: Ako je  $\alpha + \beta = \frac{\pi}{4}$ , koliko je  $(1 + \operatorname{tg} \alpha)(1 + \operatorname{tg} \beta)$ ?

Zadatak 22: Koliko je  $\cos(\alpha - \beta)$ , ako je  $\sin \alpha + \sin \beta = 1$ ,  $\cos \alpha + \cos \beta = \sqrt{2}$ ?

Zadatak 23: Koliko je  $x + y = \frac{\pi}{2}$ , koliko je  $\frac{\operatorname{tg}(x - y)}{\operatorname{tg} x - \operatorname{tg} y}$ ?

Zadatak 24: Ako je  $\sin(a + b) = \sin a \cdot \sin b + \frac{1}{4}$ , a  $\cos a + \sin b = 1$ , koliko je  $\cos^2 a + \sin^2 b$ ?

Zadatak 25: Ako je  $\operatorname{tg} a + \operatorname{tg} b = 25$ ,  $\operatorname{ctg} a + \operatorname{ctg} b = 30$ , koliko je  $\operatorname{tg}(a + b)$ ?

Zadatak 26: Ako je  $\sin x + \cos y = a$ ,  $\cos c - \sin y = b$ , koliko je  $\sin(x - y)$ ?

Zadatak 27: Ako je  $\cos 2\alpha$ , ako je  $\sin \frac{\alpha}{2} + \cos \frac{\alpha}{2} = -\frac{1}{2}$ ?

Zadatak 28: Koliko je  $\operatorname{tg} \alpha \cdot \operatorname{tg} \beta$ , ako je  $\cos(\alpha + \beta) = \frac{1}{3}$ ,  $\cos(\alpha - \beta) = \frac{1}{5}$ ?

Zadatak 29: Ako je  $x - y = \frac{2\pi}{3}$ ,  $\sin x = \frac{4\sqrt{3}}{7}$ , koliko je  $\cos y$ ,  $y \in \left\langle \pi, \frac{3\pi}{3} \right\rangle$ ?

Zadatak 30: Ako je  $x + y = \frac{3\pi}{4}$ ,  $\sin y = \frac{2\sqrt{2}}{3}$ , koliko je  $\sin x$ ,  $x \in \left\langle \frac{\pi}{2}, \pi \right\rangle$ ?

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Zadatak 31: Bez uporabe tablica ili racunala izracunaj koliko je  $\sin \frac{7\pi}{12} \cdot \sin \frac{23\pi}{12}$ ?

Zadatak 32: Izracunaj koliko je  $\sin \frac{41\pi}{12} - \sin \frac{23\pi}{12}$ ?

Zadatak 33: Bez uporabe tablica ili racunala izracunaj koliko je:

$$\cos \frac{\pi}{7} \cdot \cos \frac{2\pi}{7} \cdot \cos \frac{4\pi}{7}$$

Zadatak 34: Bez uporabe tablica ili racunala izracunaj koliko je  $\cos \frac{85\pi}{24} \cdot \cos \frac{43\pi}{24}$ ?

Zadatak 35: Izracunaj:

$$2 \sin \frac{\pi}{12} \cdot \cos \frac{\pi}{12} + \frac{\sin \frac{\pi}{3}}{\sin^4 \frac{\pi}{12} - \cos^4 \frac{\pi}{12}}$$

Zadatak 36: Izracunaj:

$$\frac{\sin 282^\circ \cdot \sin 108^\circ + \sin 12^\circ \cdot \sin 162^\circ}{\sin 55^\circ \cdot \sin 125^\circ + \sin 35^\circ \cdot \sin 145^\circ}$$

Zadatak 37: Izracunaj bez uporabe tablica ili racunala:

$$\cos \frac{2\pi}{9} + \cos \frac{4\pi}{9} + \cos \frac{6\pi}{9} + \cos \frac{8\pi}{9}$$

Zadatak 38: Izracunaj bez uporabe tablica ili racunala  $\operatorname{tg} 15^\circ + \operatorname{ctg} 15^\circ$ .

Zadatak 39: Izracunaj bez uporabe tablica ili racunala  $\sin \frac{13\pi}{24} \cdot \cos \frac{7\pi}{24}$ .

Zadatak 40: Izracunaj bez uporabe tablica ili racunala  $\sin \frac{\pi}{24} \cdot \sin \frac{5\pi}{24}$ .

Zadatak 41: Izračunaj bez uporabe tablica ili računala  $\sin^4 \frac{3\pi}{8} - \cos^4 \frac{3\pi}{8}$ .

Zadatak 42: Izračunaj:

$$\frac{\sin 37^\circ - \sin 53^\circ}{1 - 2 \cos^2 41^\circ}$$

Zadatak 43: Bez uporabe tablica i računala izračunaj  $\sin 75^\circ \cdot \cos 75^\circ$ .

Zadatak 44: Bez uporabe tablica i računala izračunaj  $\cos 15^\circ \cdot \sin 75^\circ$ .

Zadatak 45: Bez uporabe tablica i računala izračunaj  $\cos 105^\circ \cdot \sin 105^\circ$ .

Zadatak 46: Bez uporabe tablica i računala izračunaj  $\cos 105^\circ \cdot \sin 105^\circ$ .

Zadatak 47: Bez uporabe tablica i računala izračunaj  $\cos 75^\circ \cdot \sin 105^\circ$ .

Zadatak 48: Izračunaj bez uporabe tablica ili računala:

$$\frac{\sin^2 \frac{7\pi}{12} \cdot \sin^2 \frac{11\pi}{12}}{\cos \frac{7\pi}{12} \cdot \cos \frac{11\pi}{12} + \sin \frac{7\pi}{12} \cdot \sin \frac{11\pi}{12}}$$

Zadatak 49: Izračunaj bez uporabe tablica ili računala:

$$\frac{\sin^4 \frac{5\pi}{8} - \sin^4 \frac{7\pi}{8}}{\sin \frac{3\pi}{8} \cdot \cos \frac{5\pi}{8} + \sin \frac{5\pi}{8} \cdot \cos \frac{3\pi}{8}}$$

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Zadatak 50: Pojednostavni:

$$\frac{\cos \left( \frac{\pi}{2} - \beta \right) \cdot \sin \left( \frac{3\pi}{2} + \alpha \right) + \cos (\pi - \beta) \cdot \sin (2\pi - \alpha)}{\sin (\pi + \alpha - \beta)}$$

Zadatak 51: Pojednostavni:

$$\left[ \sin \left( \frac{\pi}{2} - x \right) + \sin (\pi - x) \right]^2 + \left[ \cos \left( \frac{3\pi}{2} - x \right) + \cos (2\pi - x) \right]^2$$

Zadatak 52: Pojednostavni:

$$\frac{\cos (\alpha - \pi) \cdot \cos (2\pi - \beta) - \cos \left( \frac{\pi}{2} + \alpha \right) \cdot \cos \left( \frac{\pi}{2} + \beta \right)}{\sin \left( \frac{\pi}{2} + \alpha - \beta \right)}$$

Zadatak 53: Pojednostavni:

$$\frac{1 - \sin \left( \frac{\pi}{2} + 2\alpha \right)}{\cos (\alpha - 2\pi) + \sin \left( \frac{3\pi}{2} + 3\alpha \right)}$$

Zadatak 54: Pojednostavni:

$$\frac{1 - \sin\left(\frac{3\pi}{2} + 2\alpha\right)}{\sin(\pi - 3\alpha) - \sin(-\alpha)}$$

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Zadatak 55: Pojednostavni:

$$\cos(\pi + \alpha) \cdot \sin\left(\frac{3\pi}{2} - \beta\right) - \cos\left(\frac{7\pi}{2} + \alpha\right) \cdot \sin(3\pi - \beta)$$

ako je  $\alpha + \beta = \frac{11\pi}{6}$ ?

Zadatak 56: Pojednostavni:

$$\sin(\pi - \alpha) \cdot \cos\left(\frac{3\pi}{2} + \beta\right) - \sin\left(\frac{7\pi}{2} - \alpha\right) \cdot \cos(3\pi + \beta)$$

ako je  $\alpha + \beta = \frac{11\pi}{3}$ ?

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Zadatak 57: Dokazi identitet:

$$\frac{2 \sin \frac{\pi}{2} + \sin x}{2 \sin \frac{\pi}{2} - \sin x} = \operatorname{ctg}^2 \frac{\pi}{4}$$

Zadatak 58: Dokazi identitet:

$$\frac{1 - \sin 2x}{\cos 2x} = \frac{1 - \operatorname{tg} x}{1 + \operatorname{tg} x}$$

Zadatak 59: Dokazi identitet:

$$\frac{1 - \sin 2x}{1 + \sin 2x} = \operatorname{ctg}^2\left(\frac{\pi}{4} + x\right)$$

Zadatak 60: Dokazi identitet:

$$\frac{\sin 3x}{\sin x} - \frac{\cos 3x}{\cos x} = 2$$

Zadatak 61: Dokazi identitet:

$$\frac{\sin 3x + \sin 5x}{\cos 3x + \cos 5x} = \operatorname{tg} 4x$$

Zadatak 62: Dokazi identitet:

$$\frac{2 \sin 4x + \sin 8x}{2 \sin 4x - \sin 8x} = \operatorname{ctg}^2 2x$$

Zadatak 63: Dokazi identitet:

$$\frac{\cos\left(\frac{\pi}{4} + x\right) + \cos\left(\frac{\pi}{4} - x\right)}{\cos\left(\frac{\pi}{4} + x\right) - \cos\left(\frac{\pi}{4} - x\right)} = -\operatorname{ctg} x$$

Zadatak 64: Dokazi identitet:

$$\frac{\sin\left(\frac{\pi}{4} + x\right) + \sin\left(\frac{\pi}{4} - x\right)}{\sin\left(\frac{\pi}{4} + x\right) - \sin\left(\frac{\pi}{4} - x\right)} = \operatorname{ctg} x$$

Zadatak 65: Dokazi identitet:

$$\frac{\cos x + \sin x}{\cos x - \sin x} = \operatorname{tg}\left(\frac{\pi}{4} - x\right)$$

Zadatak 66: Dokazi identitet:

$$\sin 2t \cdot \cos^3 2t - \sin^3 2t \cdot \cos 2t = \frac{1}{8} \sin 8t$$

Zadatak 67: Dokazi identitet:

$$\frac{1 - \sin 2t}{1 + \sin 2t} = \operatorname{ctg}^2\left(\frac{\pi}{4} + t\right)$$

Zadatak 68: Dokazi identitet:

$$4 \sin \alpha \cdot \cos^3 \alpha - 4 \sin^3 \alpha \cdot \cos \alpha = \sin 4\alpha$$

Zadatak 69: Dokazi identitet:

$$\sin 2\alpha - \operatorname{tg} \alpha = \operatorname{tg} \alpha \cdot \cos 2\alpha$$

Zadatak 70: Dokazi identitet:

$$\frac{\cos 4x - \cos 2x}{\sin x \cdot \sin 3x} = -2$$

Zadatak 71: Dokazi identitet:

$$\frac{\sin^2 3\alpha}{\sin^2 \alpha} - \frac{\cos^2 3\alpha}{\cos^2 \alpha} = 8 \cos 2\alpha$$

Zadatak 72: Dokazi identitet:

$$\frac{\sin(\alpha + \beta)}{\cos \alpha \cdot \cos \beta} = \operatorname{tg} \alpha + \operatorname{ctg} \beta$$

Zadatak 73: Dokazi identitet:

$$\frac{\sin(\alpha - \beta)}{\cos \alpha \cdot \cos \beta} = \operatorname{tg} \alpha - \operatorname{ctg} \beta$$

Zadatak 74: Dokazi identitet:

$$\sin(\alpha + \beta) \cdot \sin(\alpha - \beta) = \sin^2 \alpha - \sin^2 \beta$$

Zadatak 75: Dokazi identitet:

$$\cos(\alpha + \beta) \cdot \cos(\alpha - \beta) = \cos^2 \alpha - \cos^2 \beta$$

Zadatak 76: Dokazi identitet:

$$\frac{\cos^2 \alpha}{\operatorname{ctg}^2 \frac{\alpha}{2} - \operatorname{tg}^2 \frac{\alpha}{2}} = \frac{1}{4} \sin 2\alpha$$

Zadatak 77: Dokazi identitet:

$$\operatorname{tg} 4\alpha - \operatorname{tg} 2\alpha = \frac{\operatorname{tg} 4\alpha \cdot \operatorname{tg} 2\alpha}{\sin 4\alpha}$$

Zadatak 78: Dokazi identitet:

$$\frac{1 + \cos 4x}{\operatorname{ctg} x - \operatorname{tg} x} = \frac{1}{2} \sin 4x$$

Zadatak 79: Dokazi identitet:

$$\frac{\operatorname{tg} 2x \cdot \operatorname{tg} x}{\operatorname{tg} 2x - \operatorname{tg} x} = \sin 2x$$

Zadatak 80\*: Dokazi identitet:

$$\frac{\operatorname{tg}^2 2\alpha \cdot \operatorname{tg}^2 \alpha}{1 - \operatorname{tg}^2 2\alpha \cdot \operatorname{tg}^2 \alpha} = \operatorname{tg} 3\alpha \cdot \operatorname{tg} \alpha$$

Zadatak 81\*: Dokazi identitet:

$$\sin^6 \alpha - \cos^6 \alpha = 1 - \frac{3}{4} \sin^2 2\alpha$$

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Zadatak 82: Skrati razlomak:

$$\frac{\sin 5x \cdot \cos x - \cos 3x \cdot \sin x}{\cos^2 3x - \cos^2 x}$$

Zadatak 83: Pojednostavni razlomak:

$$\frac{1 + \sin 2x + \cos 2x}{1 + \sin 2x - \cos 2x}$$

Zadatak 84: Pojednostavni razlomak:

$$\frac{\sin x + 2 \sin 2x + \sin 3x}{\cos x + 2 \cos 2x + \cos 3x}$$

Zadatak 85: Skrati razlomak:

$$\frac{4 \cos^2 x - 3}{\cos 2x - \frac{1}{2}}$$

Zadatak 86: Skrati razlomak:

$$\frac{3 - 4 \sin^2 \frac{x}{2}}{4 \cos^2 \frac{x}{2} - 1}$$

Zadatak 87: Skrati razlomak:

$$\frac{\sin^2 2.5x - \sin^2 1.5x}{\cos 3x \cdot \cos 2x + \sin 4x \cdot \sin x}$$