

IME IN PRIIMEK: _____

Naloga 1:	3 + 4 + 4	↔	a.	b.	c.	
Reši enačbo:						
a.) $-3 \tan(x + \frac{\pi}{3}) = \sqrt{3}$						Rešitev: _____
b.) $\cos^2 x - \sin x = 1$						Rešitev: _____
c.) $\cos 2x = \cos 4x$						Rešitev: _____



Naloga 2:

4 + 2 + 3

↔ |a.

|b.

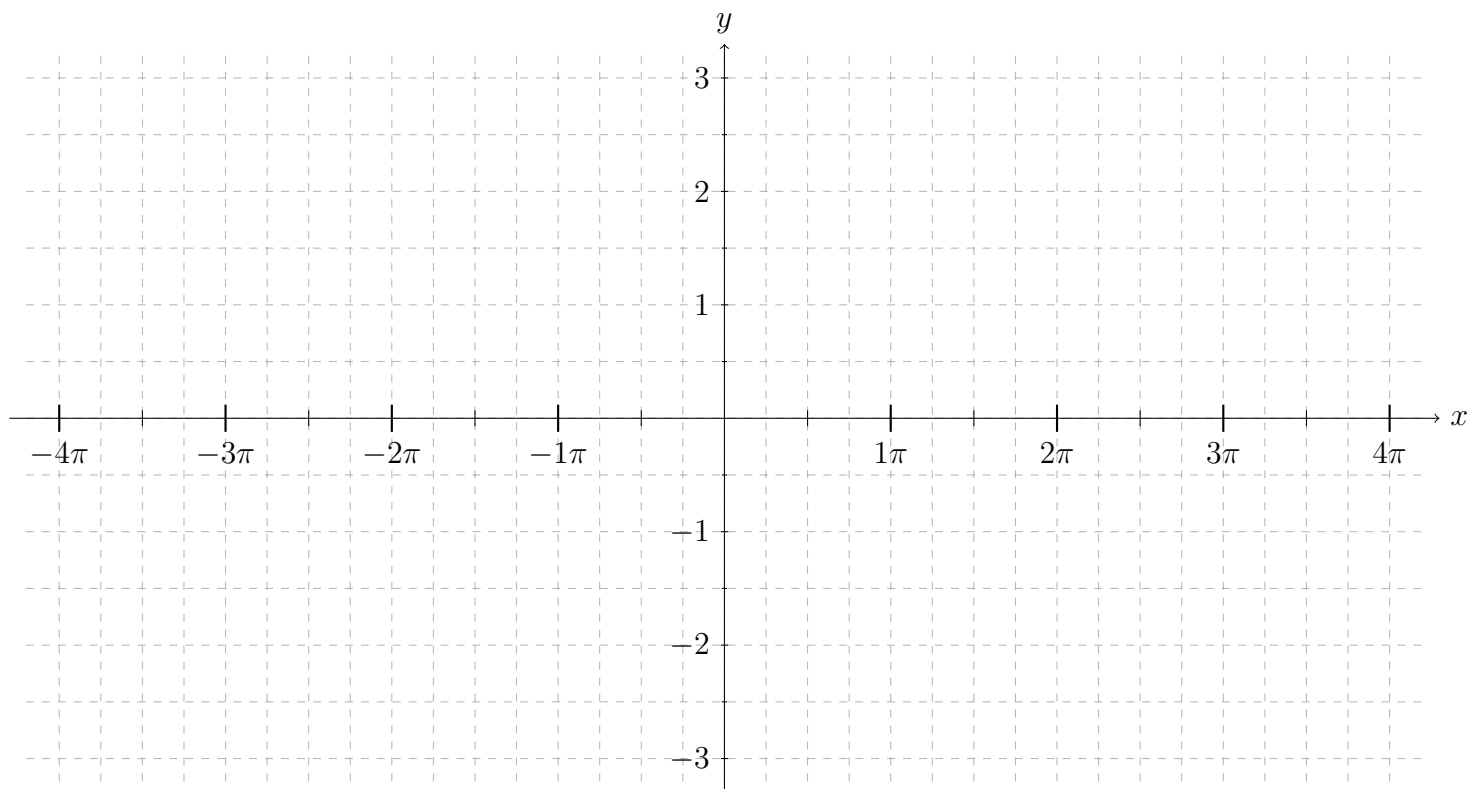
|c.

|

Podana je funkcija $f(x) = 2 \cos\left(x + \frac{\pi}{4}\right) - 1$.

b) Izračunaj ničle.

c) Nariši graf funkcije.



Naloga 3:

3 + 4

 \rightsquigarrow |a.

|b.

|c.

|d.

|

Izračunaj:

a) $\arcsin(\cos(\frac{\pi}{2} + \arctan(2 \sin \frac{\pi}{3})))$

b) s prehodom na ostri kot: $\frac{\sin^2 \frac{17\pi}{3} \cdot \cos(-\frac{11\pi}{6})}{\tan(-\frac{9\pi}{4}) - \cot^2 \frac{5\pi}{3}}$

Naloga 4:

4

 \rightsquigarrow |a.

|

Poenostavi: $\frac{2 \cos^2 x - 1}{\sin 2x} : \frac{(1 - \tan x)(1 + \tan x)}{2 \tan x}$

Naloga 5:

3 + 3 + 3

↔ |a.

|b.

|c.

|d.

|

Naj bo $\sin \alpha = \frac{12}{13}$ in α topi kot.

Izračunaj:

a) $\tan\left(\alpha + \frac{\pi}{4}\right)$

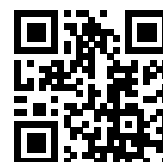
b) $\cos \frac{\alpha}{2}$

c) $\sin\left(2\alpha + \frac{\pi}{6}\right) - \sin\left(2\alpha - \frac{\pi}{6}\right)$

Število doseženih točk na testu:

število vseh točk na testu: 40

ocena	1	2	3	4	5	uspešnost v %	OCENA
%	[0, 45)	[45, 60)	[60, 75)	[75, 90)	[90, 100]		



Rešitve

Naloga 1

a)

$$-3 \tan\left(x + \frac{\pi}{3}\right) = \sqrt{3}$$

$$\tan\left(x + \frac{\pi}{3}\right) = -\frac{\sqrt{3}}{3}$$

$$x + \frac{\pi}{3} = -\frac{\pi}{6} + k\pi$$

$$x = -\frac{\pi}{2} + k\pi, \quad k \in \mathbb{Z}$$

b)

$$\cos^2 x - \sin x = 1$$

$$1 - \sin^2 x - \sin x = 1$$

$$-\sin^2 x - \sin x = 0$$

$$-\sin x(\sin x + 1) = 0$$

$$\sin x = 0 \text{ ali } \sin x = -1$$

$$x = k\pi \text{ ali } x = \frac{3\pi}{2} + 2k\pi$$

c)

$$\cos 2x = \cos 4x$$

$$\cos 2x - \cos 4x = 0$$

Uporabimo formulo:

$$\cos A - \cos B = -2 \sin \frac{A+B}{2} \sin \frac{A-B}{2}$$

$$-2 \sin\left(\frac{2x+4x}{2}\right) \sin\left(\frac{2x-4x}{2}\right) = 0$$

$$-2 \sin(3x) \sin(-x) = 0$$

$$2 \sin(3x) \sin x = 0$$

$$\sin(3x) = 0 \text{ ali } \sin x = 0$$

$$3x = k\pi \Rightarrow x = \frac{k\pi}{3}, x = k\pi, \quad k \in \mathbb{Z}$$

Naloga 2

Dana je funkcija

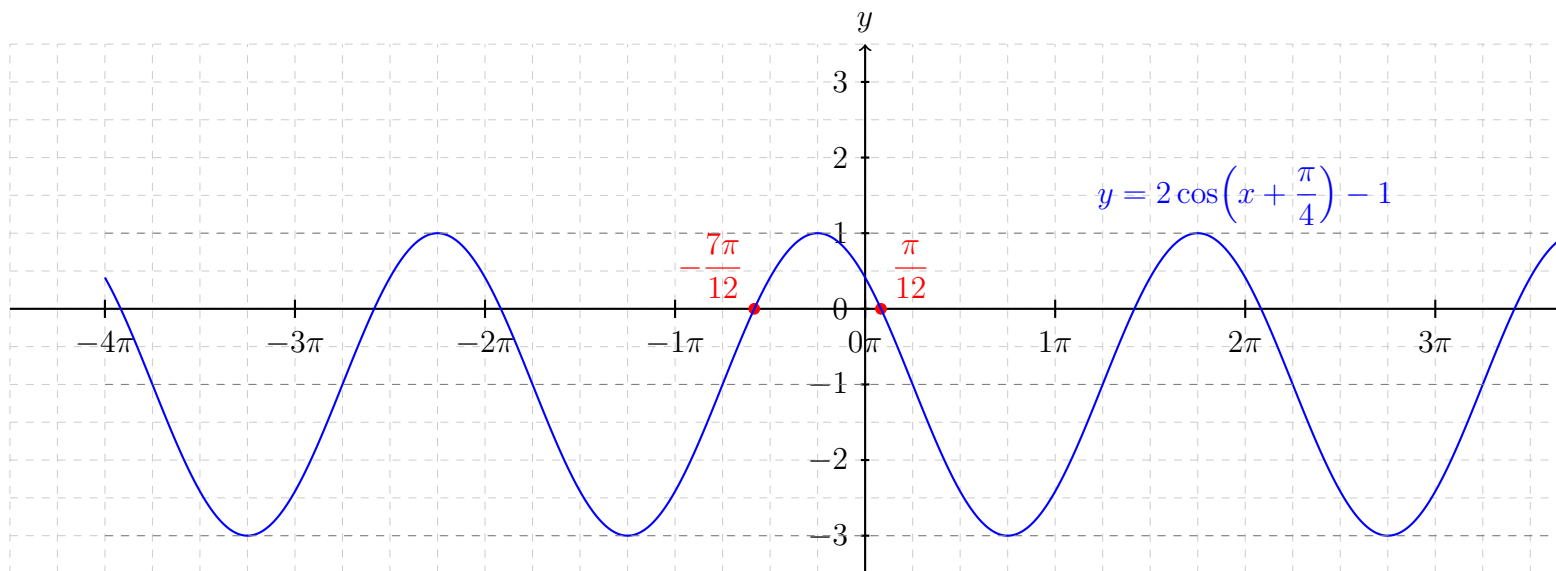
$$f(x) = 2 \cos\left(x + \frac{\pi}{4}\right) - 1.$$

b) Ničle

$$\begin{aligned}2 \cos\left(x + \frac{\pi}{4}\right) - 1 &= 0 \\ \cos\left(x + \frac{\pi}{4}\right) &= \frac{1}{2} \\ x + \frac{\pi}{4} &= \pm \frac{\pi}{3} + 2k\pi \\ x &= \frac{\pi}{12} + 2k\pi \quad \text{ali} \quad x = -\frac{7\pi}{12} + 2k\pi\end{aligned}$$

c) Graf

$$A = 2, \quad T = 2\pi, \quad B = -1, \quad \text{premik v levo } \frac{\pi}{4}.$$



Naloga 3

a)

$$\begin{aligned}\sin \frac{\pi}{3} &= \frac{\sqrt{3}}{2} \Rightarrow 2 \sin \frac{\pi}{3} = \sqrt{3} \\ \arctan(\sqrt{3}) &= \frac{\pi}{3} \\ \cos\left(\frac{\pi}{2} + \frac{\pi}{3}\right) &= \cos \frac{5\pi}{6} = -\frac{\sqrt{3}}{2} \\ \arcsin\left(-\frac{\sqrt{3}}{2}\right) &= -\frac{\pi}{3}\end{aligned}$$

b)

$$\sin^2 \frac{17\pi}{3} = \sin^2 \frac{5\pi}{3} = \left(-\frac{\sqrt{3}}{2}\right)^2 = \frac{3}{4}$$

$$\begin{aligned}\cos\left(-\frac{11\pi}{6}\right) &= \cos\frac{11\pi}{6} = \frac{\sqrt{3}}{2} \\ \tan\left(-\frac{9\pi}{4}\right) &= -1, \quad \cot\frac{5\pi}{3} = -\frac{1}{\sqrt{3}} \\ \frac{\frac{3}{4} \cdot \frac{\sqrt{3}}{2}}{-1 - \frac{1}{3}} &= \frac{\frac{3\sqrt{3}}{8}}{-\frac{4}{3}} = -\frac{9\sqrt{3}}{32}\end{aligned}$$

Naloga 4

$$\begin{aligned}\frac{2\cos^2 x - 1}{\sin 2x} &\cdot \frac{(1 - \tan x)(1 + \tan x)}{2\tan x} \\ &= \frac{\cos 2x}{\sin 2x} \cdot \frac{2\tan x}{1 - \tan^2 x} \\ &= \cot 2x \cdot \frac{2\tan x}{\cos 2x / \cos^2 x} = \frac{\sin 2x}{\sin 2x} = 1\end{aligned}$$

Naloga 5

Ker je $\sin \alpha = \frac{12}{13}$ in je α topi kot,

$$\cos \alpha = -\frac{5}{13}, \quad \tan \alpha = -\frac{12}{5}.$$

a)

$$\tan\left(\alpha + \frac{\pi}{4}\right) = \frac{\tan \alpha + 1}{1 - \tan \alpha} = \frac{-\frac{12}{5} + 1}{1 + \frac{12}{5}} = -\frac{7}{17}$$

b)

$$\cos \frac{\alpha}{2} = \sqrt{\frac{1 + \cos \alpha}{2}} = \sqrt{\frac{4}{13}} = \frac{2}{\sqrt{13}}$$

c)

$$\sin\left(2\alpha + \frac{\pi}{6}\right) - \sin\left(2\alpha - \frac{\pi}{6}\right) = 2\cos(2\alpha)\sin\frac{\pi}{6} = \cos(2\alpha) = \cos^2 \alpha - \sin^2 \alpha = -\frac{119}{169}$$