

LINEARNA FUNKCIJA

Predpis: $f(x) = kx + n$

Graf linearne je premica z enačbo $y = kx + n$

k = smerni koeficient (določa strmino/naklon premice)

• $k > 0$, tokrat premica narašča

• $k < 0$, premica pada

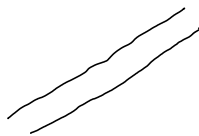
• $k = 0$, premica konstantna (vzporedna x-osi)

n = začetna vrednost (kje graf seka y os)

Nižla funkcija = kje graf seka x os

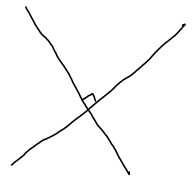
$$\begin{aligned} f(x) &= 0 \\ kx + n &= 0 \\ x &= \end{aligned}$$

VZPOREDNA PREMICA: $k = k_{||}$



PRAVOKOTNA PREMICA:

$$k_{\perp} = -\frac{1}{k}$$



1. Dana je premica z enačbo $y = 3x - 4$.

$$y = kx + n$$

a) Nariši jo v dani koordinatni sistem.

b) Izpiši smerni koeficient in začetno vrednost. $k = 3$ $n = -4$

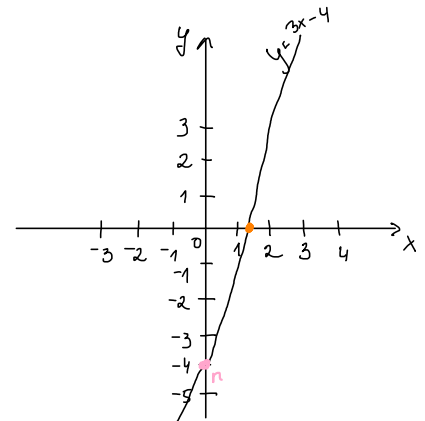
c) Izračunaj ničlo premice.

d) Ali premica narašča ali pada? Narašča

e) Zapiši enačbo vzporedne premice k dani premici, ki gre skozi točko A(1,2).

f) Zapiši enačbo pravokotne premice, ki poteka skozi točko B(-1, 3).

g) Izračunaj in zapiši presečišče dane premice s premico $y = x + 2$.



$$y = 3x - 4$$

Nižla premica: $f(x) = 0$

$$3x - 4 = 0$$

$$3x = 4 \quad | :3$$

$$x = \frac{4}{3} = 1\frac{1}{3}$$

e) $y = 3x - 4$; vzporednica skozi A(1,2)

vzporedna p.
 $k_{||} = k$

$$k_{||} = 3$$

$$y = k_{||}x + n$$

$$2 = 3 \cdot 1 + n$$

$$2 - 3 = n$$

$$\underline{\underline{-1 = n}}$$

Enačba vzporednice: $y = 3 \cdot x - 1$

f) Zapiši enačbo pravokotne premice, ki poteka skozi točko B(-1, 3).

$$y = 3x - 4$$

$$k = 3$$

$$y = k_{\perp}x + n$$

$$3 = -\frac{1}{3} \cdot (-1) + n$$

$$k_{\perp} = -\frac{1}{k}$$

$$k_{\perp} = -\frac{1}{3}$$

$$3 = \frac{1}{3} + n$$

$$3 - \frac{1}{3} = n$$

$$\frac{9}{3} - \frac{1}{3} = n$$

$$\frac{8}{3} = n$$

Enačba pravokotne premice:

$$y = -\frac{1}{3}x + \frac{8}{3}$$

g) Izračunaj in zapiši presečišče dane premice s premico $y = x + 2$.

$$P(x_1, y_1)$$

$$y = y$$

$$3x - 4 = x + 2$$

$$3x - x = 2 + 4$$

$$2x = 6 : 2$$

$$x = \frac{6}{2}$$

$$x = 3$$

$$y = 3x - 4 \text{ in } y = x + 2$$

$$y = x + 2$$

$$y = 3 + 2$$

$$y = 5$$

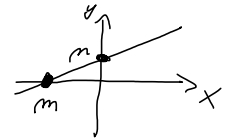
$$P\left(\begin{matrix} 3 \\ x \end{matrix}, \begin{matrix} 5 \\ y \end{matrix}\right)$$

OBLIKE ENAČB PREMICE

Eksplicitna: $y = kx + n$; koeficienti: k in n

Implicitna: $ax + by + c = 0$; $a, b, c \in \mathbb{Z}$; koeficienti: a, b, c

Odsekovna: $\frac{x}{m} + \frac{y}{n} = 1$; koeficienta: $m \leftarrow$ odsek na x -osi
 $n \leftarrow$ odsek na y -osi



2. Zapiši enačbo premice, ki poteka skozi točki $A(3, -2)$ in $B(7, 5)$. Nato enačbo premice zapiši v odsekovni obliki.

$$A(x_1, y_1)$$

$$B(x_2, y_2) \quad k = \frac{y_2 - y_1}{x_2 - x_1}$$

$$k = \frac{5 - (-2)}{7 - 3}$$

$$k = \frac{5 + 2}{4}$$

$$k = \frac{7}{4}$$

$$y = k \cdot x + n$$

$$-2 = \frac{7}{4} \cdot 3 + n$$

$$-2 = \frac{21}{4} + n$$

$$-2 - \frac{21}{4} = n$$

$$-\frac{8}{4} - \frac{21}{4} = n$$

$$-\frac{29}{4} = n$$

$$y = \frac{7}{4}x - \frac{29}{4} \text{ (eksplicitna)}$$

$$y = \frac{7}{4}x - \frac{29}{4} \quad / \cdot 4$$

$$4y = 7x - 29$$

$$-7x + 4y = -29 \quad / : (-29)$$

$$\frac{-7x}{-29} + \frac{4y}{-29} = 1$$

$$\frac{x}{\frac{29}{7}} + \frac{y}{\frac{-29}{4}} = 1$$

$$\frac{x}{\frac{29}{7}} + \frac{y}{\frac{-29}{4}} = 1 \text{ (odsekovna oblika)}$$

$m = \frac{29}{7}$ $n = -\frac{29}{4}$

$$\frac{x}{m} + \frac{y}{n} = 1$$

3. Ali ležita točki A(-1, 8) in B(-2, -7) na premici $y = -5x + 3$?

A(-1, 8) leži? Da

$$y = -5x + 3$$

$$y = -5(-1) + 3$$

$$y = 5 + 3$$

$$y = 8$$

B(-2, -7) leži? Ne, ker dobimo $y = 13$ in ne $y = -7$.

$$y = -5x + 3$$

$$y = -5(-2) + 3$$

$$y = 10 + 3$$

$$y = 13$$

4. Zapiši enačbo premice, ki je vzporedna premici $1 = \frac{x}{2} - \frac{y}{3}$ in poteka skozi točko C(4, 5). Nato enačbo vzporednice zapiši v implicitni obliki. ($0 = 2y - 3x + 2$)

$$1 = \frac{x}{2} - \frac{y}{3} \quad / \cdot 6$$

$$6 \cdot 1 = \frac{3 \cdot x}{2} - \frac{2 \cdot y}{3}$$

$$6 = 3x - 2y$$

$$2y = 3x - 6 \quad / : 2$$

$$y = \frac{3}{2}x - 3 \quad (\text{enačba premice})$$

$$k = \frac{3}{2}$$

Enačba vzporednice skozi C(4, 5)

$$k_{11} = k = \frac{3}{2}$$

$$y = kx + n$$

$$5 = \frac{3}{2} \cdot 4 + n$$

$$5 = 6 + n$$

$$-1 = n$$

$$y = \frac{3}{2}x - 1 \quad (\text{eksp.})$$

$$-\frac{3}{2}x + y + 1 = 0 \quad / : 2$$

$$-3x + 2y + 2 = 0 \quad (\text{implicitna})$$

5. Reši enačbe:

$$\frac{x+2}{x-3} = -2,$$

$$\frac{x+2}{x-3} = -2$$

$$\frac{x+2}{x-3} + 2 = 0$$

$$\frac{x+2}{x-3} + \frac{(x-3) \cdot 2}{x-3} = 0$$

$$\frac{x+2 + 2(x-3)}{x-3} = 0$$

$$\frac{x+2 + 2x-6}{x-3} = 0$$

$$\frac{3x-4}{x-3} = 0 \quad / \cdot (x-3); \quad x \neq 3$$

$$\frac{x+2}{x-3} = \frac{1}{2},$$

$$\frac{x+2}{x-3} - \frac{1}{2} = 0$$

$$\frac{(x+2) \cdot 2}{2(x-3)} - \frac{1 \cdot (x-3)}{2(x-3)} = 0$$

$$\frac{2(x+2) - 1(x-3)}{2(x-3)} = 0$$

$$\frac{2x+4-x+3}{2(x-3)} = 0$$

$$\frac{x+7}{2(x-3)} = 0 \quad / \cdot 2(x-3); \quad x \neq 3$$

$$x+7 = 0$$

$$x = -7$$

$$\frac{x-3}{x+2} = \frac{x-5}{x+3}$$

$$3x - 4 = 0$$

$$3x = 4 / :3$$

$$\underline{x = \frac{4}{3}}$$

$$\frac{x-3}{x+2} = \frac{x-5}{x+3}$$

$$\frac{x-3}{x+2} - \frac{x-5}{x+3} = 0$$

$$\frac{(x-3)(x+3)}{(x-2)(x+3)} - \frac{(x-5)(x-2)}{(x-2)(x+3)} = 0$$

$$\frac{(x-3)(x+3) - (x-5)(x-2)}{(x-2)(x+3)} = 0$$

$$\frac{x^2 + 3x - 3x - 9 - (x^2 - 2x - 5x + 10)}{(x-2)(x+3)} = 0$$

$$\frac{x^2 - 9 - x^2 + 7x - 10}{(x-2)(x+3)} = 0$$

$x-2 \neq 0 \rightarrow x \neq 2$
 $x+3 \neq 0 \rightarrow x \neq -3$

$$\frac{7x - 19}{(x-2)(x+3)} = 0 \quad ; \quad x \neq 2, x \neq -3$$

$$7x - 19 = 0$$

$$7x = 19 / :7$$

$$\underline{x = \frac{19}{7}}$$

SISTEM ENAČB

1. Sistem reši na predpisan način: 1. načinom nasprotnih koeficientov; 2. zamenjalnim načinom; 3. računanjem presečišč.

a) $2x + 4y = 8$

$$4x - 2y = 6$$

PREIZKUS: 1. način

$\approx y = y$

z NAČINOM NASP. KOEF.

$$2x + 4y = 8$$

$$4x - 2y = 6 / :2$$

$$\begin{array}{r} 2x + 4y = 8 \\ 8x - 4y = 12 \end{array} \quad (+)$$

$$10x + 0 = 20$$

$$10x = 20 / :10$$

$$x = \frac{20}{10}$$

$$\underline{x = 2}$$

$$2x + 4y = 8$$

$$2 \cdot 2 + 4y = 8$$

$$4 + 4y = 8$$

$$4y = 8 - 4$$

$$4y = 4 / :4$$

$$\underline{y = 1}$$

(2, 1)

2. NAČIN: ZAMENJALNI NAČIN

b) $-3x + 6y = 12$

$x + 2y = 4 \rightarrow x = 4 - 2y$

$-3x + 6y = 12$

$-3(4 - 2y) + 6y = 12$

$-12 + 6y + 6y = 12$

$12y = 12 + 12$

$12y = 24 : 12$

$y = 2$

$x = 4 - 2y$

$x = 4 - 2 \cdot 2$

$x = 4 - 4$

$x = 0 \quad (0, 2)$

3. NAČIN: RAČUNANJE PRESEČIŠČ

c) $3x + 4y = 8$

$4x - 3y = 6$

$-3y = 6 - 4x : (-3)$

$y = -2 + \frac{4}{3}x$

$4y = 8 - 3x : 4$

$y = 2 - \frac{3}{4}x$

$y = y$

$-2 + \frac{4}{3}x = 2 - \frac{3}{4}x : \cdot 12$

$-2 \cdot 12 + \frac{4 \cdot 12}{3}x = 2 \cdot 12 - \frac{3 \cdot 12}{4}x$

$-24 + 16x = 24 - 9x$

$16x + 9x = 24 + 24$

$25x = 48 : 25$

$x = \frac{48}{25}$

$y = 2 - \frac{3}{4}x$

$y = 2 - \frac{3}{4} \cdot \frac{48}{25}$

$y = 2 - \frac{144}{100}$

$y = \frac{200}{100} - \frac{144}{100}$

$y = \frac{56}{100} : 2$

$y = \frac{28}{50} : 2$

$y = \frac{14}{25}$

$(\frac{48}{25}, \frac{14}{25})$

NEENAČBE

↳ Neenačaji : $<$ (je manjše) ; \leq (je manjše ali enako)
 $>$ (je večje) ; \geq (je večje ali enako)

Rešitev neenačbe je interval.



2. Reši neenačbo / sistem neenačb; rešitev zapiši z intervalom in jo predstavi na številski osi:

a) $\frac{x}{2} - 1 \geq \frac{2x}{3} - \frac{1}{2} \quad / \cdot 6$



$$a) \frac{x}{2} - 1 \geq \frac{2x}{3} - \frac{1}{2} \quad | \cdot 6$$

$$3 \frac{6x}{2} - 1 \cdot 6 \geq \frac{2 \cdot 6 \cdot 2x}{3} - \frac{6 \cdot 1}{2}$$

$$3x - 6 \geq 4x - 3$$

$$3x - 4x \geq -3 + 6$$

$$\boxed{-1x} \geq 3 \quad | : (-1)$$

$$x \leq -3$$

kadar delimo/množimo
z negativnim številom,
se neenačaj obrne!



$$x \in (-\infty, -3]$$

$$(a \pm b)^2 = a^2 \pm 2ab + b^2$$

$$(a \pm b)^2 = (a \pm b)(a \pm b)$$

$$b.) 5 - 2x < (1 + 2x)^2 \ominus (1 - 2x)^2$$

$$5 - 2x < 1 + 4x + 4x^2 - (1 - 4x + 4x^2)$$

$$5 - 2x < \cancel{1} + 4x + \cancel{4x^2} - \cancel{1} + 4x - \cancel{4x^2}$$

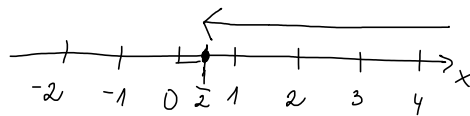
$$5 - 2x < 8x$$

$$-2x - 8x < -5$$

$$-10x < -5 \quad | : (-10)$$

$$x > \frac{-5}{-10}$$

$$x > \frac{1}{2}$$



$$x \in \left(\frac{1}{2}, \infty\right)$$

$$c) 4x + 6 > 8 - 2x > 6 - x$$

$$4x + 6 > 8 - 2x$$

$$4x + 2x > 8 - 6$$

$$6x > 2 \quad | : 6$$

$$x > \frac{2}{6}$$

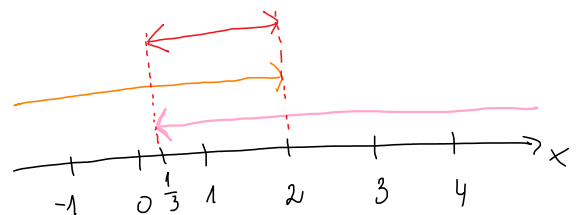
$$\boxed{x > \frac{1}{3}}$$

$$8 - 2x > 6 - x$$

$$-2x + x > 6 - 8$$

$$-1x > -2 \quad | : (-1)$$

$$\boxed{x < 2}$$



$$x \in \left(\frac{1}{3}, 2\right)$$

GEOMETRIJA V RAVNINI

1. Izračunaj preostale stranice in kote ter obseg in ploščino pravokotnega trikotnika z $\gamma = 90^\circ$, če je:

a) $\beta = 55^\circ$ ter $a = 5$ cm;

c) $a = 5$ cm, $b = 7$ cm;

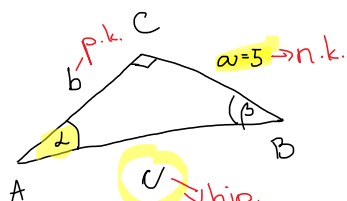
b) $\alpha = 54^\circ$ ter $a = 5$ cm;

d) $a = 5$ cm, $c = 9$ cm

(a) PRAV. Δ

$$\beta = 55^\circ$$

$$a = 5 \text{ cm}$$



$$\angle + \beta + \gamma = 180^\circ \quad (\text{v trikotniku})$$

$$\angle + 55^\circ + 90^\circ = 180^\circ$$

$$\angle + 145^\circ = 180^\circ$$

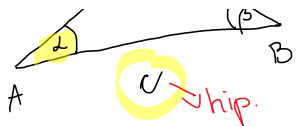
$$\angle = 180^\circ - 145^\circ$$

Pitagorov izrek!

$$\beta = 55^\circ$$

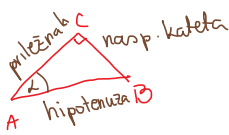
$$a = 5 \text{ cm}$$

$$a^2 + b^2 = c^2$$



KOTNE FUNKCIJE

↳ uporaba v Δ



$$\sin \alpha = \frac{\text{nasp. k.}}{\text{hip.}} \quad \left[\begin{array}{l} \text{streha} \\ \text{nad} \\ \text{hišo} \end{array} \right]$$

$$\cos \alpha = \frac{\text{prilozna k.}}{\text{hip.}} \quad \left[\begin{array}{l} \text{klet} \\ \text{pod} \\ \text{hišo} \end{array} \right]$$

$$\tan \alpha = \frac{\text{nasp. k.}}{\text{pril. k.}} \quad \left[\begin{array}{l} \text{triglavski} \\ \text{park} \end{array} \right]$$

$$\cot \alpha = \frac{\text{pril. k.}}{\text{nasp. k.}}$$

$\alpha + \beta = 90^\circ$

$$\alpha + 145^\circ = 180^\circ$$

$$\alpha = 180^\circ - 145^\circ$$

$$\alpha = 35^\circ$$

$$\sin \alpha = \frac{h}{r}$$

$$\sin 35^\circ = \frac{5}{h} \quad | \cdot h$$

$$h \cdot \sin 35^\circ = 5 \quad | : \sin 35^\circ$$

$$h = \frac{5}{\sin 35^\circ}$$

$$h = 8,72 \text{ cm}$$

$$c = 8,72 \text{ cm}$$

Pitagorov izrek:

$$h^2 = k^2 + k^2$$

$$k^2 = h^2 - k^2$$

$$k^2 = 8,72^2 - 5^2$$

$$k^2 = 76,0384 - 25$$

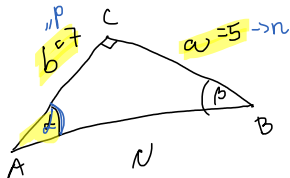
$$k^2 = 51,0384 \quad | \sqrt{\quad}$$

$$k = \sqrt{51,0384}$$

$$k = 7,14 \text{ cm}$$

$$b = 7,14 \text{ cm}$$

c) $a = 5 \text{ cm}, b = 7 \text{ cm};$



$$c^2 = a^2 + b^2$$

$$c^2 = 7^2 + 5^2$$

$$c^2 = 49 + 25$$

$$c^2 = 74 \quad | \sqrt{\quad}$$

$$c = 8,6 \text{ cm}$$

$$\tan \alpha = \frac{n}{p}$$

$$\tan \alpha = \frac{5}{7} \quad \rightarrow \text{na kalk.} \quad \text{Znd} \rightarrow \tan \rightarrow \tan^{-1}$$

$$\alpha = \tan^{-1}(5:7)$$

$$\alpha = 35,5^\circ$$

$$\alpha + \beta + 90^\circ = 180^\circ$$

$$\alpha + \beta = 90^\circ$$

$$35,5^\circ + \beta = 90^\circ$$

$$\beta = 90^\circ - 35,5^\circ$$

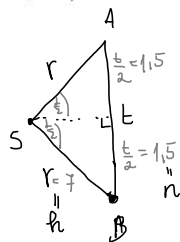
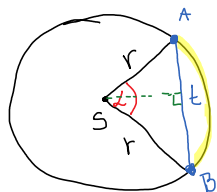
$$\beta = 54,5^\circ$$

2. Dana je krožnica s polmerom 7 cm. Na krožnici si izberemo dve točki, tako da nastane 3 cm dolga tetiva. Kolikšen središčni kot pripada tetivi? (R: $24,75^\circ$)

$$r = 7 \text{ cm}$$

$$\text{tetiva} \rightarrow t = 3 \text{ cm}$$

$$\alpha = ?$$



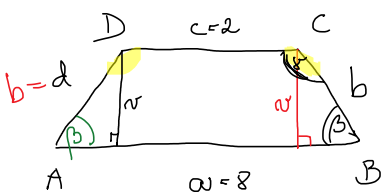
$$\sin\left(\frac{\alpha}{2}\right) = \frac{n}{r}$$

$$\sin\left(\frac{\alpha}{2}\right) = \frac{1,5}{7}$$

$$\frac{\alpha}{2} = 12,37^\circ \quad | \cdot 2$$

$$\alpha = 24,75^\circ$$

4. Dan je trapez ABCD $a=8 \text{ cm}, c=2 \text{ cm}, v=4 \text{ cm}$ in $\beta = 75^\circ$. Izračunaj ploščino lika in kot γ .
Izračunaj stranico b .



ploščina

$$S = \frac{a+c}{2} \cdot v$$

$$S = \frac{8+2}{2} \cdot 4$$

$$4 = \frac{v}{n} \quad \left[\begin{array}{l} \text{b} \\ \text{Rip.} \end{array} \right]$$

$$\sin \beta = \frac{n}{b}$$

$$\sin 75^\circ = \frac{v}{b} \quad | \cdot b$$

$$b \cdot \sin 75^\circ = v \quad | : \sin 75^\circ$$

$$b = \frac{v}{\sin 75^\circ}$$

za štirikotnik:

$$\alpha + \beta + \gamma + \delta = 360^\circ$$

$$\beta + \beta + \delta + \delta = 360^\circ$$

$$2\beta + 2\delta = 360^\circ$$

$$2 \cdot 75^\circ + 2\delta = 360^\circ$$

$$150^\circ + 2\delta = 360^\circ$$

$$2\delta = 360^\circ - 150^\circ$$

$$2\delta = 210^\circ \quad | : 2$$

$$S = \frac{8+2}{2} \cdot 4$$

$$S = \frac{10}{2} \cdot 4$$

$$S = 20 \text{ cm}^2$$

$$b \cdot \sin 75^\circ = r / \sin 75^\circ$$

$$b = \frac{r}{\sin 75^\circ}$$

$$b = \frac{4}{\sin 75^\circ}$$

$$b = 4,14 \text{ cm}$$

$$2 \gamma = 360^\circ - 150^\circ$$

$$2 \gamma = 210^\circ / :2$$

$$\gamma = 105^\circ$$

7. Z uporabo osnovnih povezav izračunaj $\sin \alpha$ in $\cot \alpha$, če je $\cos \alpha = \frac{3}{5}$ in $\alpha \in (0^\circ, 90^\circ)$. (R: 4/5)

$\cot \alpha = \text{ctg} \alpha \rightarrow \boxed{\text{ctg} \alpha = \frac{\sin \alpha}{\cos \alpha}}$

$\text{ctg} \alpha = \frac{\cos \alpha}{\sin \alpha}$

$\text{ctg} \alpha = \frac{\frac{3}{5}}{\frac{4}{5}} = \frac{3 \cdot 5}{5 \cdot 4} = \frac{3}{4}$

$\text{ctg} \alpha = \frac{3}{4}$

$$\sin^2 \alpha + \cos^2 \alpha = 1$$

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

$$\sin^2 \alpha = 1 - \left(\frac{3}{5}\right)^2$$

$$\sin^2 \alpha = 1 - \frac{9}{25}$$

$$\sin^2 \alpha = \frac{16}{25}$$

$$\sin \alpha = \pm \sqrt{\frac{16}{25}}$$

$$\sin \alpha = \pm \frac{4}{5}$$

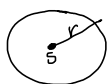
$\sin \alpha = \frac{4}{5} \checkmark$

$\sin \alpha = -\frac{4}{5}$

11. Ploščina kroga meri 314 cm^2 . Kolikšen je njegov obseg?

$$S = 314 \text{ cm}^2$$

$$\sigma = ?$$



$$S = \pi \cdot r^2$$

$$314 = \pi \cdot r^2 / : \pi$$

$$\frac{314}{\pi} = r^2$$

$$99,95 = r^2 / \sqrt{\quad}$$

$$r = 9,99 \text{ cm}$$

$$\sigma = 2\pi \cdot r$$

$$\sigma = 2\pi \cdot 9,99$$

$$\sigma = 62,8 \text{ cm}$$

8. Dan je trikotnik ABC, $\beta = 90^\circ$, $c = 7 \text{ cm}$ in $a = 3 \text{ cm}$. Izračunaj vrednosti kotnih funkcij za kot α .

PRAVOKOTNI Δ

$a = 3 \text{ cm}$

$c = 7 \text{ cm}$

$\beta = 90^\circ$

kotne f. za kot α

kotne f.

$$\sin \alpha = \frac{n}{h}$$

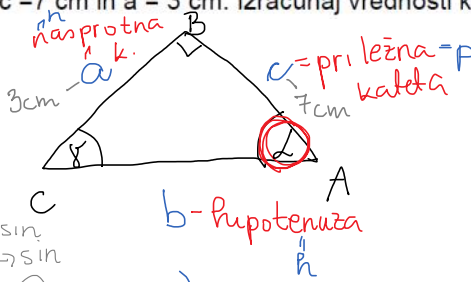
$$\sin \alpha = \frac{a}{c}$$

2nd \rightarrow sin
shift \rightarrow sin

$$\sin^{-1} (3 : 7,6) = \alpha$$

$$\alpha = 23,25^\circ$$

$\alpha - c$



$$\text{ctg} \alpha = \frac{n}{p}$$

$$\text{ctg} \alpha = \frac{a}{c} = \frac{3}{7}$$



Pitagorov izrek:

$$h^2 = k^2 + k^2$$

$$b^2 = a^2 + c^2$$

$$b^2 = 3^2 + 7^2$$

$$b^2 = 9 + 49$$

$$b^2 = 58 / \sqrt{\quad}$$

$$b = \sqrt{58}$$

(a) $S = a^2$
 $S = 12^2$
 $S = 144 \text{ cm}^2$

(b) $V = S_{\text{osn}} \cdot v$; $S_{\text{osn}} = \text{ploščina osnovne ploskve}$
 $V_{\text{kocke}} = S_{\text{osn}} \cdot a$
 $V_{\text{kocke}} = a^3$
 $V_{\text{kocke}} = 12^3$
 $V_{\text{kocke}} = 1728 \text{ cm}^3$

(c) $P = 2 \cdot S_{\text{osn}} + S_{\text{pl}}$
 $P = 2 \cdot S_{\text{osn}} + \sigma \cdot v$
 $P_{\text{kocke}} = 2 \cdot a^2 + 4a \cdot a$
 $P_{\text{kocke}} = 6a^2$
 $P_{\text{kocke}} = 6 \cdot 12^2$
 $P_{\text{kocke}} = 864 \text{ cm}^2$

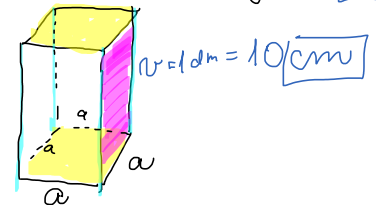
(d) $12 \cdot \overset{\text{rob}}{12} = 144 \text{ cm}$

pravilni n-kotnik → osnovna ploskev = kvadrat

3. Osnovna ploskev pravilne štiristrane prizme meri 64 cm^2 . Prizma je visoka 1 dm. Dopolni povedi.

$S_{\text{osn}} = 64 \text{ cm}^2$

- a) Osnovni rob prizme meri 8 cm.
- b) Plašč te prizme meri 320 cm².
- c) Prostornina te prizme meri 640 cm³.
- d) Za izdelavo te prizme potrebujemo 4,48 dm² kartona.



(a) $S_{\text{osn}} = 64$
 $a^2 = 64 / \sqrt{\quad}$
 $a = \sqrt{64}$
 $a = 8 \text{ cm}$

(b) $S_{\text{pl}} = \sigma \cdot v$ (obseg kv.)
 $S_{\text{pl}} = 4 \cdot a \cdot v$
 $S_{\text{pl}} = 4 \cdot 8 \cdot 10$
 $S_{\text{pl}} = 320 \text{ cm}^2$

(c) $V = S_{\text{osn}} \cdot v$
 $V = 64 \cdot 10$
 $V = 640 \text{ cm}^3$

(d) $P = 2$
 $P = 2 \cdot S_{\text{osn}} + S_{\text{pl}}$
 $P = 2 \cdot 64 + 320$
 $P = 448 \text{ cm}^2$
 $P = 4,48 \text{ dm}^2$

11. Izračunaj površino in prostornino valja, ki ima polmer 5cm in višino 7cm.

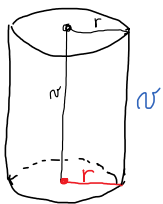
VALJ

$V = S_{\text{osn}} \cdot v$ (osnovna ploskev valja = KROG)

$r = 5 \text{ cm}$

$v = 7 \text{ cm}$

$P, V = ?$



$V = \pi r^2 \cdot v$

$V = \pi \cdot 5^2 \cdot 7$

$V = \pi \cdot 175$

$V = 549,79 \text{ cm}^3$

$P = 2 \cdot S_{\text{osn}} + S_{\text{pl}}$

$P = 2 \cdot \pi r^2 + \sigma \cdot v$

$P = 2 \cdot \pi r^2 + 2\pi r \cdot v$

$P = 2\pi \cdot 5^2 + 2\pi \cdot 5 \cdot 7$

$P = 120\pi$

$P = 376,99 \text{ cm}^2$

12. Izračunaj površino in prostornino enakostraničnega valja, ki ima polmer 5cm.

ENAK. VALJ

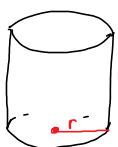
$v = 2r$

$v = 2 \cdot 5$

$v = 10 \text{ cm}$

$r = 5 \text{ cm}$

$P, V = ?$



$v = 2 \cdot r$
 valja ≠ a
 enakostranični

$V = S_{\text{osn}} \cdot v$

$V = \pi r^2 \cdot v$

$V = \pi \cdot 5^2 \cdot 10$

$V = 250\pi$

$V = 785,40 \text{ cm}^3$

$P = 2 \cdot S_{\text{osn}} + S_{\text{pl}}$

$P = 2 \cdot \pi r^2 + 2\pi r \cdot v$

$P = 2\pi \cdot 5^2 + 2\pi \cdot 5 \cdot 10$

$P = 50\pi + 100\pi$

$P = 150\pi$

$P = 471,24 \text{ cm}^2$

valy

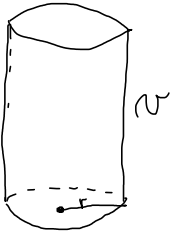
14. Površina valja znaša $520\pi \text{ cm}^2$, višina pa meri 7cm. Izračunaj prostornino in polmer ter osni presek valja.

VALJA

$$P = 520\pi \text{ cm}^2$$

$$v = 7 \text{ cm}$$

$$\frac{V}{r^2} = \text{osni presek}^2$$



$$P = 2 \cdot S_{\text{v}} + S_{\text{pl}}$$

$$r = 20 \text{ cm}$$

$$P = 2\pi r^2 + 2\pi r \cdot v$$

$$V = S_{\text{v}} \cdot v$$

$$520\pi = 2\pi r^2 + 2\pi r \cdot 7 \quad /: 2\pi$$

$$V = \pi r^2 \cdot v$$

$$\frac{520\pi}{2\pi} = r^2 + 7r$$

$$V = \pi \cdot 20^2 \cdot 7$$

$$260 - r^2 + 7r = 0$$

$$V = 2800\pi$$

$$-r^2 + 7r + 260 = 0 \quad /: (-1)$$

$$V = 8796,46 \text{ cm}^3$$

$$r^2 - 7r - 260 = 0 \quad (\text{uporabimo Vietovo p.})$$

$$13 \cdot (-20) = -260$$

$$(r+13)(r-20) = 0$$

$$r_1 = -13 \quad r_2 = 20 \text{ cm}$$

7. Osnovni rob pravilne 4-strane piramide meri 8 cm, višina pa 3 cm. Izračunaj površino in prostornino te piramide.

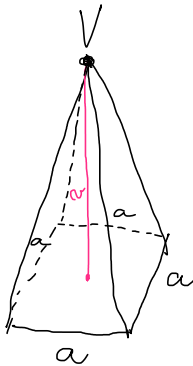
PRAVILNA 4-STRANA PIRAMIDA

osnovna ploskev = kvadrat

$$a = 8 \text{ cm}$$

$$v = 3 \text{ cm}$$

$$P, V = ?$$



$$V = \frac{S_{\text{v}} \cdot v}{3}$$

$$V = \frac{64 \cdot 3}{3}$$

$$V = 64 \text{ cm}^3$$

$$P = S_{\text{v}} + S_{\text{pl}}$$

$$P = 64 + 96$$

$$P = 160 \text{ cm}^2$$

$$S_{\text{v}} = a^2$$

$$S_{\text{pl}} = a \cdot v$$

$$S_{\text{v}} = 8^2$$

$$S_{\text{pl}} = 4 \cdot a \cdot v$$

$$S_{\text{v}} = 64 \text{ cm}^2$$

$$S_{\text{pl}} = 4 \cdot 8 \cdot 3$$

$$S_{\text{pl}} = 96 \text{ cm}^2$$

4. Izračunaj površino prizme, ki ima za osnovno ploskev pravokotni trikotnik s kateto 6 cm in hipotenuzo 10 cm. Višina prizme pa je 4 cm.

PRIZMA

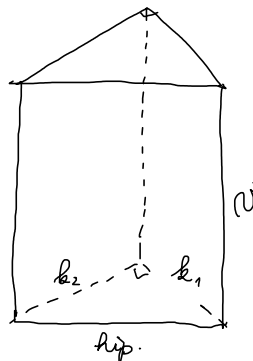
osnovna ploskev = pravokotni Δ

$$k_1 = 6 \text{ cm}$$

$$h = 10 \text{ cm}$$

$$v_{\text{prizme}} = 4 \text{ cm}$$

$$P = ?$$



$$P = 2 \cdot S_{\text{v}} + S_{\text{pl}}$$

$$P = 2 \cdot 24 + 96$$

$$P = 144 \text{ cm}^2$$

$$S_{\text{v}} = \frac{k_1 \cdot k_2}{2}$$

$$\Delta \text{ kateti } S = \frac{a \cdot b}{2}$$

$$S_{\text{v}} = \frac{6 \cdot 8}{2}$$

$$S_{\text{v}} = 24 \text{ cm}^2$$

$$S_{\text{pl}} = a \cdot v$$

$$S_{\text{pl}} = (k_1 + k_2 + h) \cdot v$$

$$P = 2$$

$$\begin{aligned} h^2 &= k_1^2 + k_2^2 \\ k_2^2 &= h^2 - k_1^2 \\ k_2^2 &= 10^2 - 6^2 \\ k_2^2 &= 64 \sqrt{\quad} \\ k_2 &= \underline{\underline{8 \text{ cm}}} \end{aligned}$$

$$\underline{\underline{S_w = 24 \text{ cm}^2}}$$

$$\begin{aligned} S_{pl} &= (h_{ip} + k_1 + k_2) \cdot r \\ S_{pl} &= (10 + 6 + 8) \cdot 4 \\ S_{pl} &= \underline{\underline{96 \text{ cm}^2}} \end{aligned}$$