

② $a_1, a_2, \dots, a_n$ - סדרה חשבונית

1) $d=3 \Rightarrow \boxed{a_2 - a_1 = 3}$

$a_1, b_1, a_2, b_2, \dots, a_n \leftarrow$ סדרה חשבונית
זוגית

$\Downarrow$
 $a_2 - a_1 = 2d = 3 \Rightarrow \boxed{d = 1.5}$

$\boxed{n = 2n-1}$

$$\frac{S_{2n-1}}{S_n} = \frac{[2a_1 + (2n-2) \cdot 1.5] \cdot \frac{2n-1}{2}}{[2a_1 + (n-1) \cdot 3] \cdot \frac{n}{2}}$$

$$= \frac{[2a_1 + (n-1) \cdot 3] \cdot \frac{2n-1}{2}}{[2a_1 + (n-1) \cdot 3] \cdot \frac{n}{2}} = \frac{2n-1}{n}$$

$\underline{\underline{R_1}}$

2) $\frac{2n-1}{n} = 1.9 \Rightarrow \boxed{n = 10}$

$S_{n-1} = 130.5 \Rightarrow [2b_1 + 8 \cdot 3] \cdot \frac{9}{2} = 130.5 \Rightarrow \boxed{b_1 = 2.5}$

$b_1 - a_1 = 1.5 \Rightarrow \boxed{a_1 = 1}$ $\underline{\underline{R_2}}$

3) $a_1, b_1, b_2, b_3, \dots, b_k, a_2, \dots$

$a_2 - a_1 = (k+1)d \Rightarrow \boxed{d = \frac{3}{k+1}}$
 $\underline{\underline{R_3}}$

3

$$P(\neg A_j | B_i) = p$$

$$\Rightarrow P(A_j) = 1 - (p + k)$$

$$P(\neg A_j | B_k) = k$$

$$\underbrace{\binom{4}{2} \cdot p^2 \cdot (1-p)^2}_{2 \text{ ייתכנו } \neg A_j \wedge B_i} + \underbrace{\binom{4}{3} \cdot p^3 \cdot (1-p)}_{3 \text{ ייתכנו } \neg A_j \wedge B_i} = \underbrace{10 \cdot p^4}_{\neg A_j \wedge B_i \text{ 4 פעמים}}$$

$$6p^2(1-p)^2 + 4p^3(1-p) = 10p^4 \quad / : p^2 > 0$$

$$6(1-p)^2 + 4p(1-p) = 10p^2$$

$$6 - 12p + 6p^2 + 4p - 4p^2 = 10p^2$$

$$8p^2 + 8p - 6 = 0 \quad / : 2$$

$$4p^2 + 4p - 3 = 0$$

$$p_{1,2} = \frac{-4 \pm 8}{8} \rightarrow \boxed{p_1 = \frac{1}{2}}$$

$$\rightarrow p_2 = -1.5 \notin (0 < p < 1)$$

$$\boxed{P(\neg A_j | B_i) = \frac{1}{2}} \quad \text{לכל } B_i$$

$$P(\text{True}) = 0.34$$

$$\Rightarrow \frac{1}{2} \cdot k + \frac{1}{2} \cdot k + \left[1 - \left(\frac{1}{2} + k\right)\right]^2 = 0.34$$

I $\neg A_j \wedge B_i$ I $\neg A_j \wedge B_i$ $\neg A_j \wedge B_i$
II $\neg A_j \wedge B_k$ II $\neg A_j \wedge B_i$ $\neg A_j$

$$k + \left(\frac{1}{2} - k\right)^2 = 0.34$$

$$k + \frac{1}{4} - k + k^2 = 0.34 \Rightarrow k^2 = 0.09$$

$$k = \pm 0.3$$

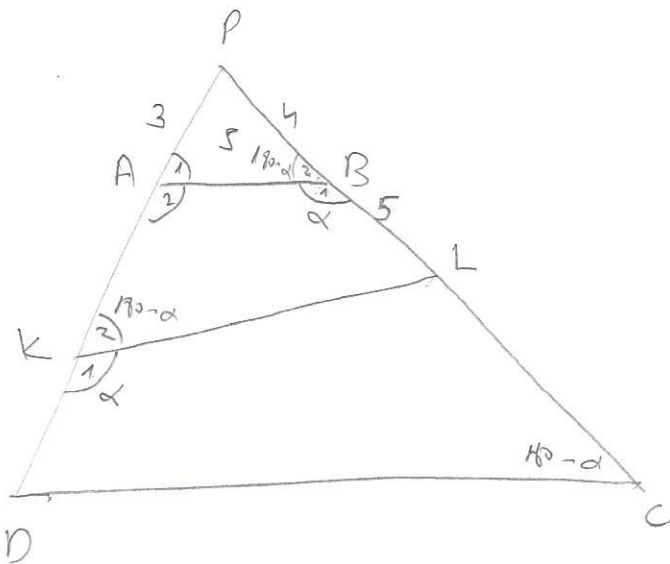
$$k > 0 \quad \boxed{k = 0.3} \Rightarrow \boxed{P(\neg A_j | B_k) = 0.3} \quad \text{לכל } B_k$$

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$$\begin{aligned}
 \rightarrow P(\text{II גרלה} / \text{גרלה} / \text{הטבע שיווין}) &= \frac{P(\text{גרלה} \cap \text{הטבע שיווין})}{P(\text{גרלה} \text{ הטבע שיווין})} \\
 &= \frac{P(\text{גרלה} \cap \text{הטבע שיווין})}{P(\text{גרלה} \text{ הטבע שיווין})} = \frac{\frac{1}{2} \cdot 0.3}{0.34} = \frac{15}{34}
 \end{aligned}$$

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1) האם $AB \parallel KL$ (כן)

2) האם $KL \parallel DC$ (כן)

3) $\angle K_1 = \alpha$ (הצורה)

4) $\angle C = 180 - \alpha$ (הצורה, $180^\circ + 3 + 2 = 180^\circ$)

5) $\angle K_2 = 180 - \alpha$ (הצורה, $180^\circ + 3 + 2 = 180^\circ$)

6) $\angle B_1 = \alpha$ (הצורה, $180^\circ + 4 + 5 = 180^\circ$)

7) $AB \parallel DC$ (הצורה, $180^\circ + 6 + 4 = 180^\circ$)

8) $PA = 3$ (כן)

9) $PB = 4$ (כן)

10) $S_{\triangle PAB} = 5$ (כן)

11) $S_{ABCD} = 74$

12) $\angle B_2 = 180 - \alpha$ (הצורה, $180^\circ + 6 + 4 = 180^\circ$)

←

$$13) AP \neq PB \quad (9, 8 \text{ נק'})$$

$$14) \angle A_1 \neq \angle B_2 \neq 180^\circ - \alpha \quad (5 \text{ נק' - נדרש } \triangle APB \text{ וזה לא אפשרי})$$

$$15) \angle A_2 \neq \alpha \quad (12 \text{ נק' } \angle A + 14 \text{ נק'})$$

$$16) \angle A_2 + \angle C \neq 180^\circ \quad (15, 4 \text{ נק'})$$

$$17) \boxed{\begin{array}{c} ABCD \\ \text{זווית} \\ \text{נדרש} \end{array}} \quad (4 \text{ נק' } \angle A + 16 \text{ נק'})$$

$$18) S_{DPC} = 25 \text{ ש} \quad (10, 11 \text{ נק' - נדרש } \triangle DPC)$$

$$19) \angle P \quad (3 \text{ נק'})$$

$$20) \angle B_2 = \angle C = 180^\circ - \alpha \quad (12, 4 \text{ נק'})$$

$$21) \triangle DPC \sim \triangle APB \quad (5, 5 \text{ נק' } \angle A + 20, 10 \text{ נק'})$$

$$22) \frac{S_{DPC}}{S_{APB}} = \left(\frac{DP}{AP}\right)^2 \quad (1 \text{ נק' - נדרש } \triangle DPC \text{ וזה לא אפשרי})$$

$$\Rightarrow \frac{25 \text{ ש}}{5} = \left(\frac{DP}{3}\right)^2 \Rightarrow DP^2 = 225$$

$$DP > 0 \Rightarrow \boxed{DP = 15 \text{ מ'}} \quad \text{נדרש}$$

$$23) \triangle KPL \sim \triangle BPA \quad (19, 12, 5 \text{ נק'})$$

$$24) \frac{S_{KPL}}{S_{BPA}} = \left(\frac{PL}{PA}\right)^2 \quad (22 \text{ נק' } \angle A + 23 \text{ נק'})$$

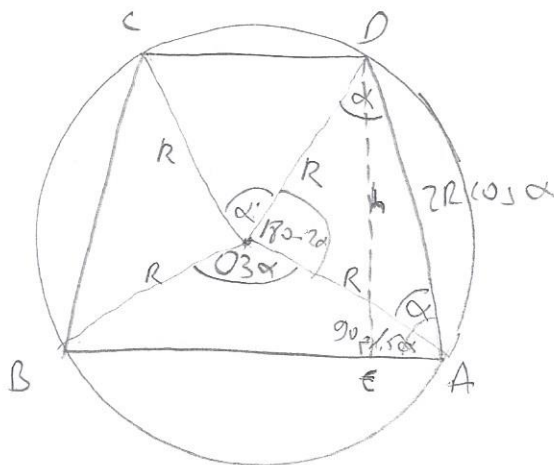
$$\frac{S_{KPL}}{5} = \left(\frac{9}{3}\right)^2 \Rightarrow \boxed{S_{KPL} = 9 \text{ ש}}$$

$$\Rightarrow \boxed{S_{KLCD} = S_{DPC} - S_{KPL} = 25 \text{ ש} - 9 \text{ ש} = 16 \text{ ש}}$$

נדרש

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1) $\sin \angle ABC$

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2) $\angle A$ כחית 150

3) $\angle OCA = \angle CAB$ (כחית 150 + 150 = 300)

4) $BC = AD$ (כחית 150 + 150 = 300)

5) $\sin \angle ABC$ (כחית 150)

4, 1 כחית

6) $OC = OD = R$

110

7) $\angle COD = \alpha$

110

8) $BO = OA = R$

110

9) $\angle BOA = 3\alpha$

110

10) $\triangle COB \cong \triangle DOA$ (כחית 150 + 150 = 300)

11) $\angle COB = \angle DOA = \frac{360 - 4\alpha}{2} = 180 - 2\alpha$ (כחית 150 + 150 = 300)

12) $\angle ODA = \angle OAD = \alpha$ (כחית 150 + 150 = 300)

13) $\angle OBA = \angle OAB = \frac{180 - 3\alpha}{2} = 90 - 1.5\alpha$ (כחית 150 + 150 = 300)

$\triangle BOA$

←

$$14) \boxed{\angle DAB = 90 - \frac{\alpha}{2}} \quad ($$

113, 114 + 13, 12 'DP)

1/2 R

$$15) \underline{ADDA}$$

$$\frac{AD}{\frac{\sin(180-2\alpha)}{\sin 2\alpha}} = \frac{R}{\sin \alpha} \Rightarrow AD = \frac{R \cdot \sin 2\alpha}{\sin \alpha} = \frac{2R \sin \alpha \cdot \cos \alpha}{\sin \alpha}$$

$$\boxed{AD = BC = 2R \cos \alpha}$$

1/2 R

$$16) \underline{DDEA} \quad 115 \text{ DP}$$

$$\frac{h}{AD} = \frac{\sin(90 - \frac{\alpha}{2})}{\cos \frac{\alpha}{2}} \Rightarrow \boxed{AD = \frac{h}{\cos \frac{\alpha}{2}}} \quad \text{1/2 R}$$

$$17) 2R \cos \alpha = \frac{h}{\cos \frac{\alpha}{2}} \quad (16, 115 \text{ DP})$$

$$\Rightarrow \boxed{R = \frac{h}{2 \cos \alpha \cdot \cos \frac{\alpha}{2}}} \quad \text{1/2 R}$$

$$S_{\triangle COD} = \frac{h^2}{12 \cos^2 \frac{\alpha}{2}} \Rightarrow \frac{R^2 \cdot \sin \alpha}{2} = \frac{h^2}{12 \cos^2 \frac{\alpha}{2}}$$

$$\frac{h^2 \cdot \sin \alpha}{8 \cos^2 \alpha \cdot \cos^2 \frac{\alpha}{2}} = \frac{h^2}{12 \cos^2 \frac{\alpha}{2}} \quad / : \frac{h^2}{\cos^2 \frac{\alpha}{2}} > 0$$

$$\frac{\sin \alpha}{8 \cos^2 \alpha} = \frac{1}{12}$$

$$\Rightarrow 12 \sin \alpha - 8 \cos^2 \alpha = 0$$

1/2 R ←

$$12 \sin \alpha - 8(1 - \sin^2 \alpha) = 0$$

$$\Rightarrow 8 \sin^2 \alpha + 12 \sin \alpha - 8 = 0 \quad / :4$$

$$2 \sin^2 \alpha + 3 \sin \alpha - 2 = 0$$

$$\sin \alpha = t \quad \text{נציב}$$

$$2t^2 + 3t - 2 = 0$$

$$t_1 = -2 \Rightarrow \sin \alpha = -2 \quad \phi \quad (-1 \leq \sin \alpha \leq 1)$$

$$t_2 = \frac{1}{2} \Rightarrow \sin \alpha = \frac{1}{2}$$

$$\alpha = 30^\circ + 360^\circ k$$

$\Downarrow$

$$k=0 \quad \text{כאשר } \alpha \text{ הוא } 30^\circ$$

$$\boxed{\alpha = 30^\circ}$$

$$\alpha = 150^\circ + 360^\circ k$$

ϕ

אם ניקח 150° ונחבר 360° נקבל 510° שזה לא 30° כי $510^\circ = 150^\circ + 360^\circ$

$$(6) \quad f(x) = \frac{2(\cos^2 x - 1)}{2\cos^2 x} = \frac{\cos 2x}{\cos 2x + 1}$$

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b) $0 \leq x \leq \frac{\pi}{2}$

1) התחלה

$$\cos 2x + 1 \neq 0 \Rightarrow \cos 2x \neq -1$$

$$2x \neq \pi + 2\pi k \quad \because 2$$

$$x \neq \frac{\pi}{2} + \pi k$$

$$k=0 \Rightarrow \boxed{x \neq \frac{\pi}{2}} \Rightarrow \boxed{0 \leq x < \frac{\pi}{2}} \quad \underline{\underline{1 \text{ L } \mathbb{R}_N}}$$

2) አገልግሎት

$X = \frac{H}{2}$ מרחק מן המרכז

א' חנוכה אף י"ג ח' - א'

$$y=0 \Rightarrow \cos x = 0$$

$$2x = \frac{\pi}{2} + \pi k \quad / : 2$$

$$X = \frac{11}{5} + \frac{11}{2} K$$

$$K_{20} \Rightarrow x = \frac{\pi}{5} \Rightarrow \left(\frac{\pi}{5}, 0 \right)$$

$$K=1 \Rightarrow X = \frac{\sqrt{N}}{4} \text{ and } \sin \theta \approx \frac{1}{N}$$

4)

$$f'(x) = \frac{-2 \sin 2x (\cos 2x + 1) + 2 \cos 2x \cdot \sin 2x}{(\cos 2x + 1)^2}$$

$$\leftarrow f(x) = \frac{-2 \sin 2x}{(\cos 2x + 1)^2}$$

$$f'(x) = 0 \Rightarrow -2 \sin 2x = 0 \quad / : -2$$

$$\sin 2x = 0$$

$$2x = \pi k \quad / : 2$$

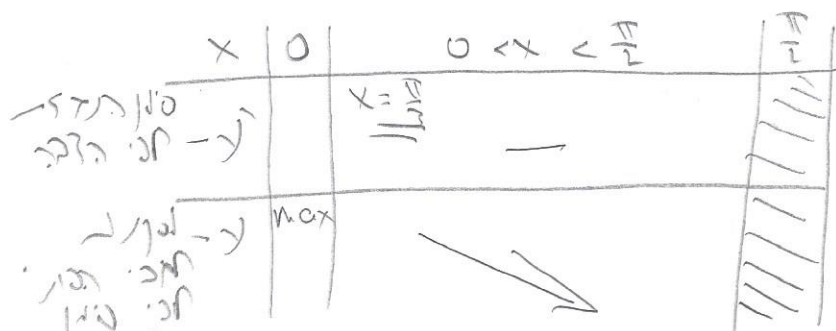
$$x = \frac{\pi}{2} k$$

$$k=0 \Rightarrow \boxed{x=0}$$

$$k=1 \Rightarrow x = \frac{\pi}{2} \quad \text{no}$$

(cos) בנקודה
הזוהי.

$$f(0) = \frac{1}{1+1} = \frac{1}{2} \Rightarrow (0, \frac{1}{2})$$



הפונקציה $f(x)$ היא פונקציה זוגית (even) ולכן $f(x) = f(-x)$.
הפונקציה $f(x)$ היא פונקציה זוגית (even) ולכן $f(x) = f(-x)$.

$$f'(\frac{\pi}{2}) = \frac{-2 \cdot \sin \frac{2\pi}{2}}{(+)} = \frac{-2}{+} < 0$$

$$\Rightarrow \boxed{\max(0, \frac{1}{2})}$$

$$2) \quad \underline{\underline{-\frac{\pi}{2} < x < \frac{\pi}{2}}}$$

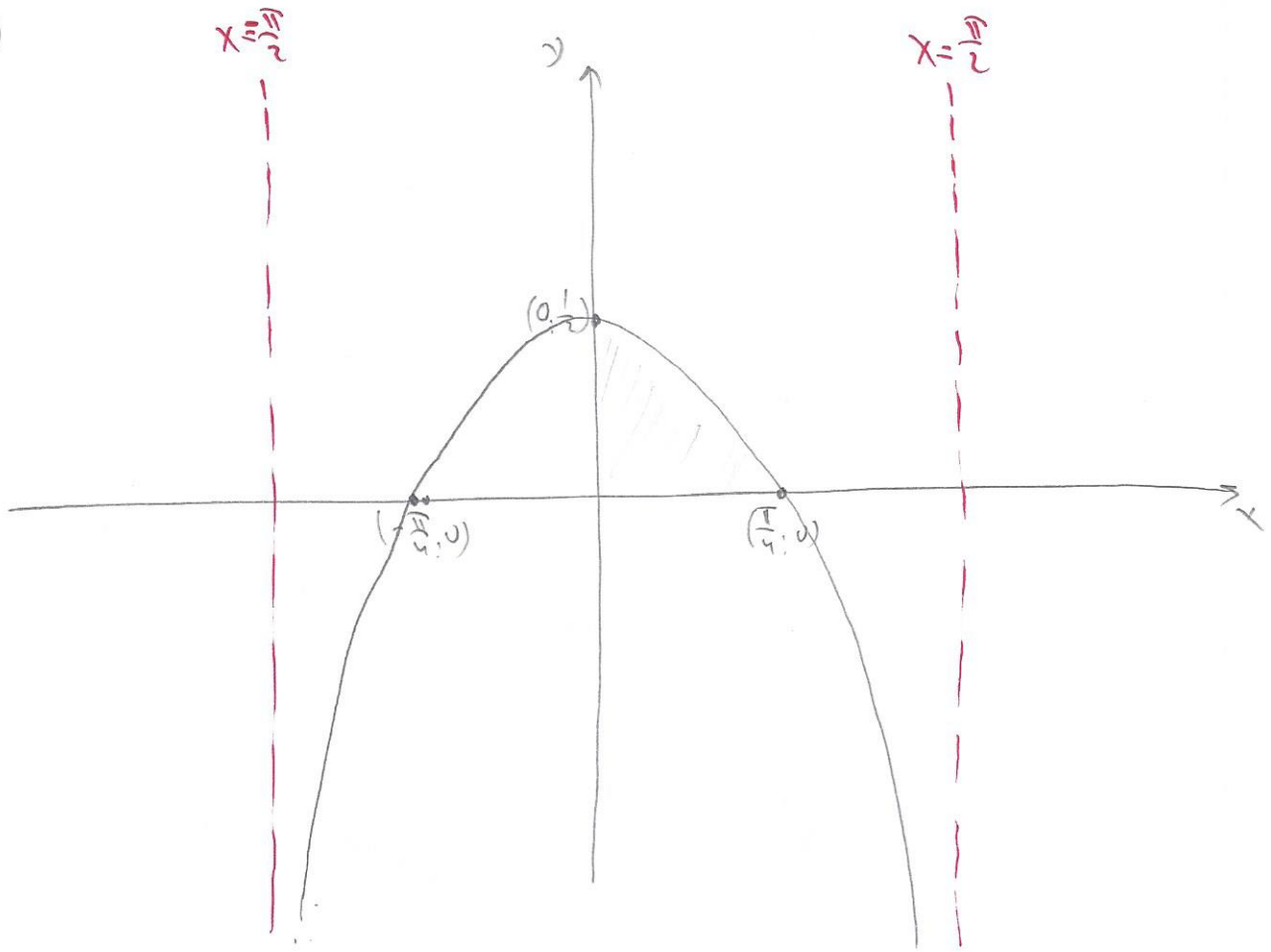
$$1) \quad f(-x) = \frac{\cos(-2x)}{\cos(-2x)+1} = \frac{\cos 2x}{\cos 2x+1}$$

$$\{ \cos(-\alpha) = \cos \alpha \}$$

$$\Rightarrow \boxed{f(x) = f(-x)} \quad \text{פונקציה זוגית}$$



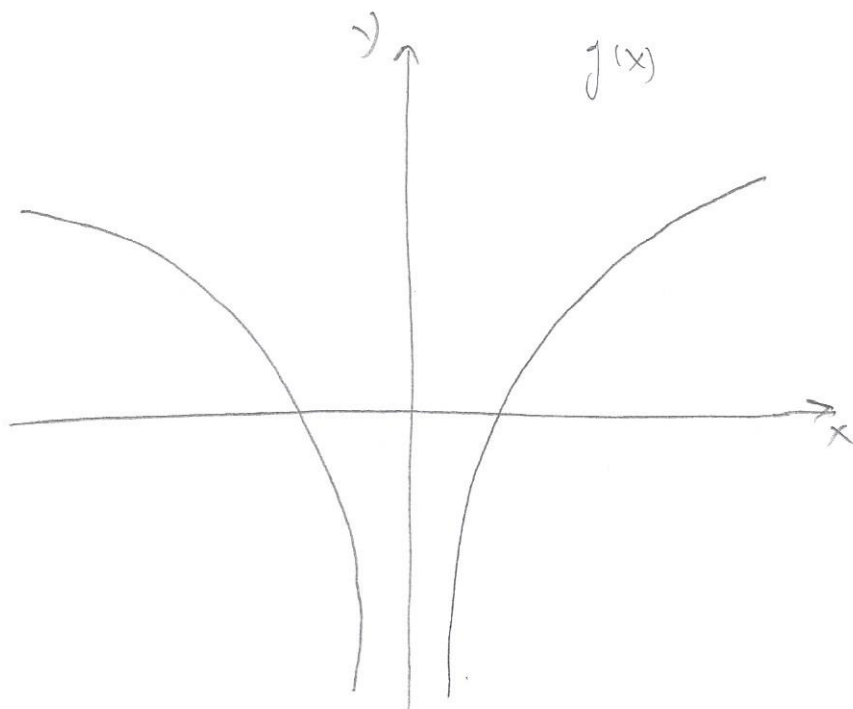
2)



$$\begin{aligned}
 2) \quad S &= \int_0^{\frac{\pi}{2}} \frac{2\cos^2 x - 1}{2\cos^2 x} dx = \int_0^{\frac{\pi}{2}} \left(1 - \frac{1}{2\cos^2 x}\right) dx = \left[x - \frac{\operatorname{tg} x}{2}\right]_0^{\frac{\pi}{2}} \\
 &= \frac{\pi}{4} - \frac{\operatorname{tg} \frac{\pi}{4}}{2} - [0] = \frac{\pi}{4} - \frac{1}{2} = \underline{\underline{0.285}}
 \end{aligned}$$

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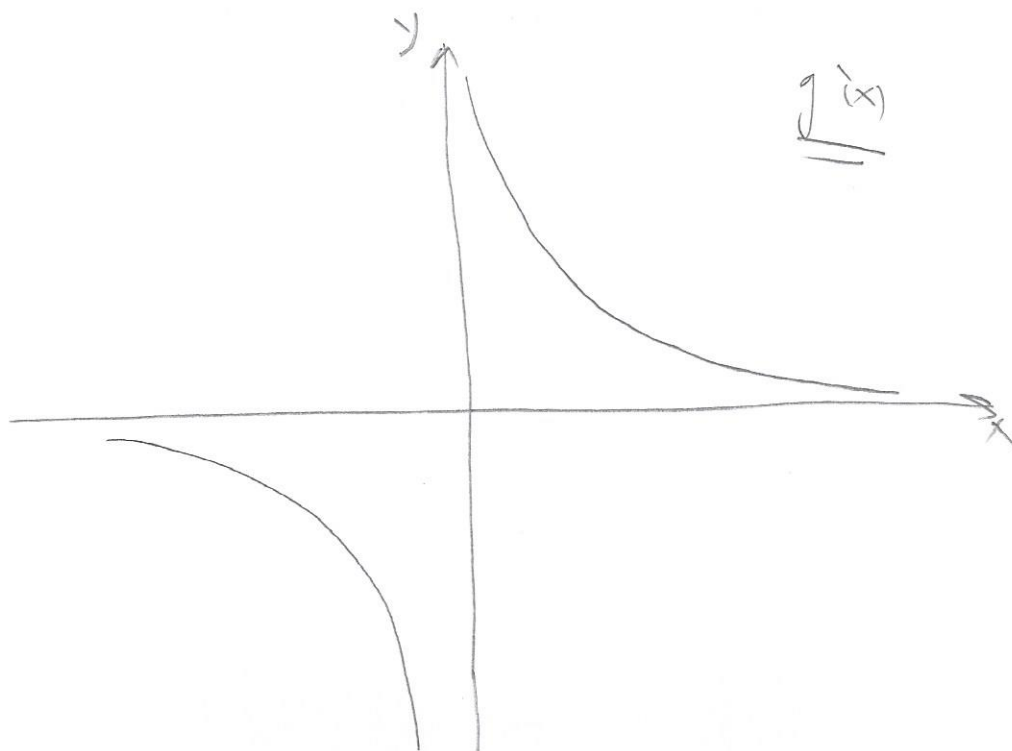
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$(x \neq 0)$

x	$x < 0$	0	$x > 0$
$f(x) - f(x_0)$	$-$	$\parallel$	$+$
$f(x) - f(x_0)$	$\searrow$	$\parallel$	$\nearrow$

הפונקציה $f(x)$ היא פונקציה זוגית
 $x=0$ נקודת סימטריה

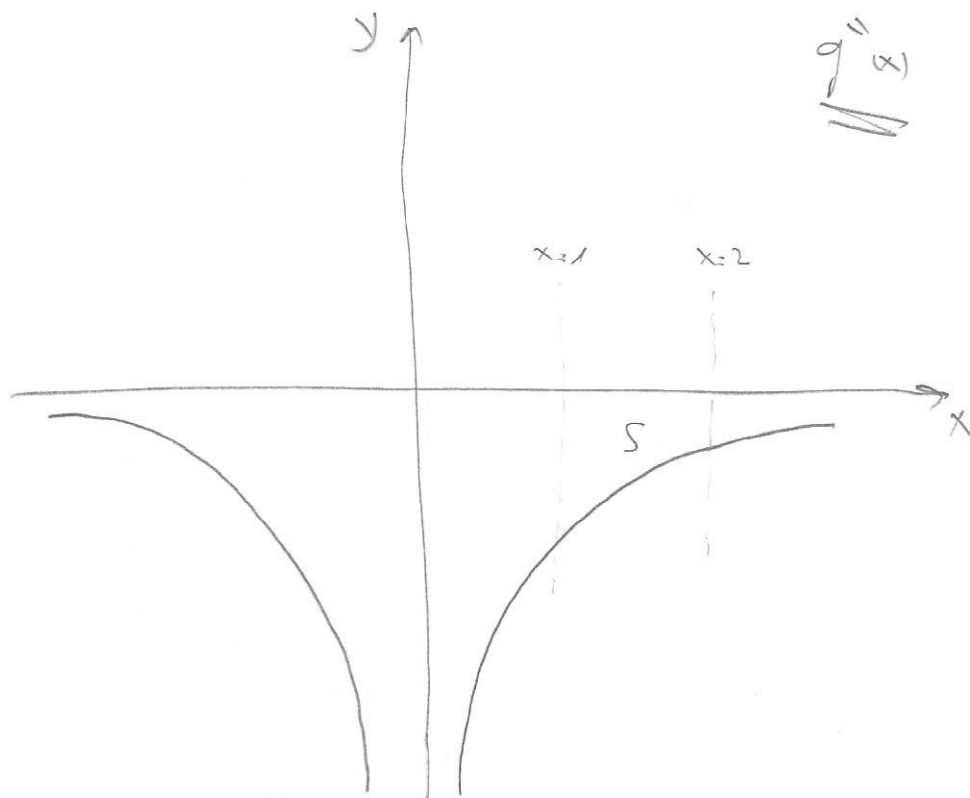


7) $(f''(x) > 0) \Rightarrow f(x)$ is concave up $x < 0$

$(f''(x) < 0) \Rightarrow f(x)$ is concave down $x > 0$

$$\Rightarrow g''(x) < 0 \quad x \neq 0$$

if $f(x)$ is concave up then $f(x)$ is increasing



$$S = 5.25 \Rightarrow \int_1^2 -g''(x) dx = 5.25 \Rightarrow [-g'(x)]_1^2 = 5.25$$

$$-g'(2) + g'(1) = 5.25$$

2) $A(1, g'(1))$
 $B(2, g'(2))$

$$\Rightarrow y_A - y_B = g'(1) - g'(2) = 5.25$$



$$1) \quad y = \frac{a}{x^3} \quad a > 0$$

$$y(-x) = \frac{a}{-x^3} \Rightarrow -y(-x) = \frac{a}{x^3}$$

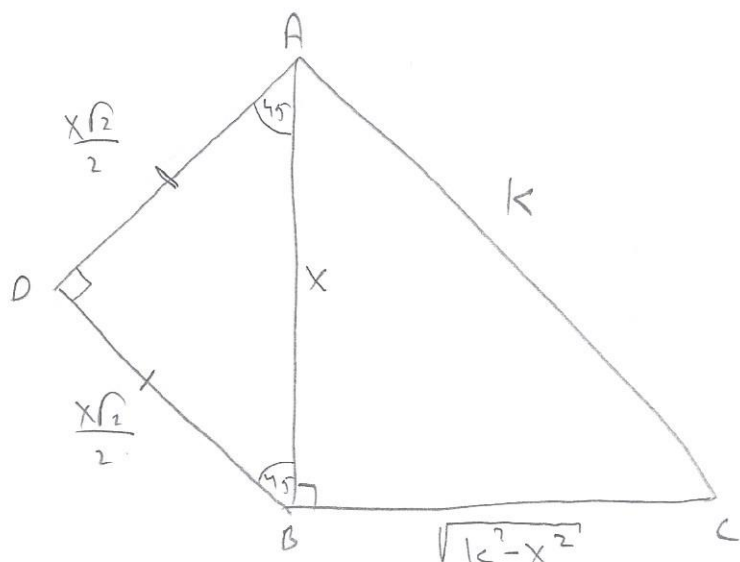
$$\Rightarrow y(x) = -y(-x) \Rightarrow \boxed{y'(x) = \frac{a}{x^3}} \quad \text{mit } k \cdot 1/2$$

$$2) \quad g'(1) - g'(2) = 5,25$$

$$\frac{a}{1} - \frac{a}{8} = 5,25 \Rightarrow \boxed{a = 6} \quad \underline{\underline{2'7 \text{ Rnd}}}$$

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$AD = BD$

|||

$\triangle ABC$

$BC = \sqrt{k^2 - x^2}$

only one of

$\triangle ADB$

$AD^2 + AD^2 = x^2$

only one of

$2AD^2 = x^2 \Rightarrow AD^2 = \frac{x^2}{2}$

$AD = \frac{x}{\sqrt{2}} = \frac{x\sqrt{2}}{2} = BD$

$F(x) = BC \cdot AD^2 = \frac{x^2 \cdot \sqrt{k^2 - x^2}}{2}$

$F'(x) = \frac{2x \cdot \sqrt{k^2 - x^2} + x^2 \cdot \frac{-2x}{2\sqrt{k^2 - x^2}}}{2} = \frac{2x(k^2 - x^2) - x^3}{2\sqrt{k^2 - x^2}}$

$F'(x) = \frac{-3x^3 + 2k^2x}{2\sqrt{k^2 - x^2}}$



$$\hat{F}(x) = 0 \Rightarrow -3x^3 + 2k^2x = 0$$

$$-x(3x^2 - 2k^2) = 0$$

$$x=0 \quad \text{or} \quad \begin{pmatrix} x > 0 \\ \text{or} \end{pmatrix}$$

$$3x^2 - 2k^2 = 0 \Rightarrow x^2 = \frac{2k^2}{3}$$

$$\text{if } x > 0 \Rightarrow \boxed{x = \sqrt{\frac{2}{3}} k_{\text{cm}}}$$

		$x = 0.816k$	
x	$x < 0.815k$	$x = \sqrt{\frac{2}{3}}k$	$x > 0.817k$
$\dot{y}$	+		-
y		max	

אם x יהיה y המקסימום של $F(x)$ בנקודה הזו.

$$\hat{F}(0.815k) = \frac{-3 \cdot (0.815k)^3 + 2k^2(0.815k)}{(+)} = \frac{0.005k^3}{(+)} > 0$$

$$\hat{F}(0.817k) = \frac{-3(0.817k)^3 + 2k^2(0.817k)}{(+)} = \frac{-0.0021k^3}{(+)} < 0$$

$$\Rightarrow \boxed{\text{max } x = \sqrt{\frac{2}{3}} k_{\text{cm}}}$$

$$11) F\left(\sqrt{\frac{2}{3}}k\right) = 3\sqrt{3} \Rightarrow \frac{\frac{2k^2}{3} \cdot \sqrt{k^2 - \frac{2k^2}{3}}}{2} = 3\sqrt{3}$$

$$\frac{2k^2}{3} \cdot \frac{k}{\sqrt{3}} = 6\sqrt{3} \Rightarrow 2k^3 = 54 \Rightarrow k^3 = 27 \Rightarrow \boxed{k = 3_{\text{cm}}}$$

$$S_{\text{ADB}} = \frac{\frac{x\sqrt{2}}{2} \cdot \frac{x\sqrt{2}}{2}}{2} = \frac{x^2}{4} = \frac{\frac{2k^2}{3}}{4} = \frac{k^2}{6} = \frac{9}{6}$$

$$\boxed{S_{\text{ADB}} = 1.5 \text{ cm}^2}$$

א.א.