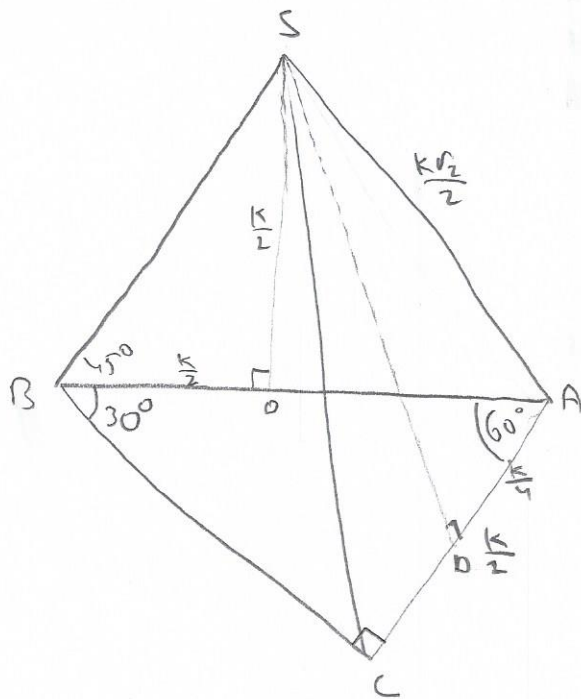




1) $\angle C = 90^\circ$ 11-)

$$\Rightarrow BO = OA = \frac{k}{2} \quad (4, 2, 1 \text{ 2P})$$

4) $AB = I_K$ ||n||

5) $\angle ABC = 30^\circ$

7) $AL = \frac{K}{2}$ (זמן 1, 5, 6 + זמן 15 - סכומן $30^\circ 60^\circ 90^\circ$
הנקודות של הזווית הנקראת שווה זווית - הזווית

ד) $\angle SBO = 45^\circ$ (הוכח כי $BS \perp SO$)

g) $\angle B O S = 90^\circ$ 1/1

10) $\angle BSO = 41^\circ$ ($180^\circ - \angle BSO \approx 5 \text{ cm} + 9,8 \text{ cm}$)

11) $BO = SO = \frac{K}{2}$ (Anzahl $\Delta SBO \approx 110$ $\sim 1/3$ FN + 10, 8, 3 am)
 ~ 110 $\sim 1/3$

←
1017

$$V = \frac{S_{\triangle ABC} \cdot SO}{3} = \frac{k \cdot \frac{k}{2} \cdot \sin 60 \cdot \frac{1}{2} \cdot \frac{k}{2}}{3} = \frac{\frac{k^3 \cdot \sqrt{3}}{16}}{3}$$

$$\boxed{V = \frac{k^3 \cdot \sqrt{3}}{48}} \quad \underline{\underline{k^3}}$$

12) $\triangle SDO$

$$BS = \sqrt{\frac{k^2}{4} + \frac{k^2}{4}} = \frac{k}{\sqrt{2}} = \frac{k\sqrt{2}}{2} \quad (\text{תנאי פיתגורס})$$

13) $BS = AS = CS = \frac{k\sqrt{2}}{2}$ (תנאי 12) כירחית יטרה) 12

14) $CD = DA = \frac{k}{4}$ (תנאי 7, 13 + הקובץ חסום בלשם) 13
הם גם חיון

15) $\triangle SAD$

$$\boxed{SD = \sqrt{\frac{k^2}{2} - \frac{k^2}{16}} = \frac{k\sqrt{7}}{4}}$$

(תנאי פיתגורס)

תנאי

3) $F(x) = \sqrt{x}$ $g(x) = \left(\frac{1}{2}\right)^{x-1} = 2^{1-x}$ $x \geq 0$

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6) $F(x) = \sqrt{x}$

$F'(x) = \frac{1}{2\sqrt{x}} > 0$ $x \geq 0$ x x x x

$\Downarrow$
 $x > 0$ x

$g(x) = 2^{1-x}$

$g'(x) = -2^{1-x} \cdot \ln 2 < 0$ x x

$x > 0$ x

7) $F(0) = 0 \Rightarrow (0, 0)$

$\min_{(0,0)} (0,0)$ x x x x

$g(0) = 2 \Rightarrow (0, 2)$

$\max_{(0,2)} (0,2)$ x x x x

8) $F(4) = 2$

$g(4) = \frac{1}{8} \Rightarrow F(4) > g(4)$

$g(x) \leq F(x)$ $x=4$ x x x

9) $F(0) = 0$

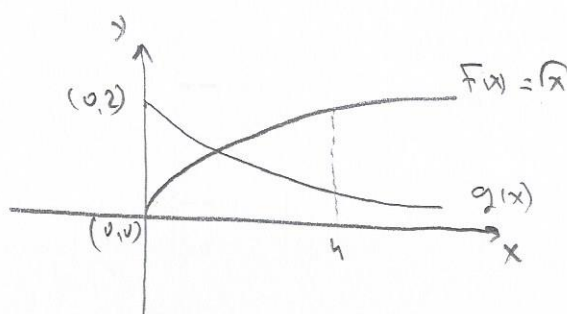
$g(0) = 2 \Rightarrow F(0) < g(0)$

$F(x)$ x

$g(x)$ x

$F(4) > g(4)$

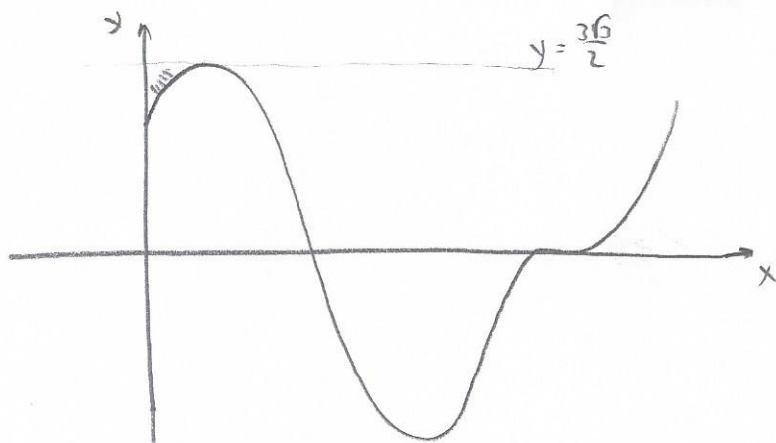
$\Rightarrow$ x x x x



4

$$f(x) = \sin 2x + 2 \cos x \quad 0 \leq x \leq 2\pi$$

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1.) $\boxed{f'(x) = 2 \cos 2x - 2 \sin x}$

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

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

$$1 - 2 \sin^2 x - \sin x = 0 \quad | \cdot -1$$

$$2 \sin^2 x + \sin x - 1 = 0$$

$$\sin x = t \quad (0 \leq t \leq 1)$$

$$2t^2 + t - 1 = 0$$

$$t_{1,2} = \frac{-1 \pm 3}{4} \rightarrow t_1 = \frac{1}{2} \rightarrow t_2 = -1$$

$$\sin x = \frac{1}{2}$$

$$\boxed{x = \frac{\pi}{6} + 2\pi k}$$

$$k=0 \quad x = \frac{\pi}{6}$$

$$k=1 \quad \emptyset$$

$$\boxed{x = \frac{5\pi}{6} + 2\pi k}$$

$$x = \frac{5\pi}{6}$$

$$\emptyset$$

$$\sin x = -1$$

$$\boxed{x = -\frac{\pi}{2} + 2\pi k}$$

$$x = -\frac{\pi}{2} \quad \emptyset$$

$$x = \frac{3\pi}{2}$$

$$f\left(\frac{\pi}{6}\right) = \sin \frac{\pi}{3} + 2 \cos \frac{\pi}{6} = \frac{3\sqrt{3}}{2} \Rightarrow \left(\frac{\pi}{6}, \frac{3\sqrt{3}}{2}\right)$$

$$f\left(\frac{5\pi}{6}\right) = \sin \frac{5\pi}{6} + 2 \cos \frac{5\pi}{6} = -\frac{3\sqrt{3}}{2} \Rightarrow \left(\frac{5\pi}{6}, -\frac{3\sqrt{3}}{2}\right)$$

$$f\left(\frac{3\pi}{2}\right) = \sin 3\pi + 2 \cos \frac{3\pi}{2} = 0 \Rightarrow \left(\frac{3\pi}{2}, 0\right)$$

100%

$$\text{בגל} F(0) = \sin 0 + 2 \cos 0 = 2 \Rightarrow (0, 2)$$

$$\text{בגל} F(2\pi) = \sin 4\pi + 2 \cos 2\pi = 2 \Rightarrow (2\pi, 2)$$

$$\boxed{F'(x) = -4 \sin 2x - 2 \cos x}$$

$$F'\left(\frac{\pi}{6}\right) = -4 \sin \frac{\pi}{3} - 2 \cos \frac{\pi}{6} = -5.19 < 0 \Rightarrow \boxed{\max\left(\frac{\pi}{6}, \frac{3\sqrt{3}}{2}\right)}$$

$$F'\left(\frac{5\pi}{6}\right) = -4 \sin \frac{5\pi}{3} - 2 \cos \frac{5\pi}{6} = 5.19 > 0 \Rightarrow \boxed{\min\left(\frac{5\pi}{6}, -\frac{3\sqrt{3}}{2}\right)}$$

$$F'\left(\frac{3\pi}{2}\right) = -4 \sin 3\pi - 2 \cos \frac{3\pi}{2} = 0 \leftarrow \begin{array}{l} \text{נקודה קריטית} \\ \text{בגל} \end{array}$$

$$\Rightarrow \boxed{\begin{array}{l} \min(0, 2) \\ \text{בגל} \\ \max(2\pi, 2) \\ \text{בגל} \end{array}}$$

$\max\left(\frac{\pi}{6}, \frac{3\sqrt{3}}{2}\right)$ נקודה קריטית בגל

נקודה קריטית בגל $y = \frac{3\sqrt{3}}{2}$ נקודה קריטית בגל

$$\begin{aligned} \Rightarrow S &= \int_0^{\frac{\pi}{6}} \left[\frac{3\sqrt{3}}{2} - (\sin 2x + 2 \cos x) \right] dx = \int_0^{\frac{\pi}{6}} \left(-\sin 2x - 2 \cos x + \frac{3\sqrt{3}}{2} \right) dx \\ &= \left[\frac{\cos 2x}{2} - 2 \sin x + \frac{3\sqrt{3}}{2} x \right]_0^{\frac{\pi}{6}} \end{aligned}$$

$$= \frac{\cos \frac{\pi}{3}}{2} - 2 \sin \frac{\pi}{6} + \frac{3\sqrt{3}}{2} \cdot \frac{\pi}{6} - \left[\frac{\cos 0}{2} - 2 \sin 0 + 0 \right]$$

$$= \frac{1}{4} - 1 + \frac{\sqrt{3}\pi}{4} - \frac{1}{2} = \frac{\sqrt{3}\pi - 5}{4} \approx 0.1$$

5) $f(x) = \ln(2x - ax^2)$

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$f(1) = \frac{2}{3} \quad : \text{נר}$

1)
$$f(x) = \frac{2 - 2ax}{2x - ax^2}$$

$f(1) = \frac{2}{3} \Rightarrow \frac{2 - 2a}{2 - a} = \frac{2}{3} \Rightarrow 6 - 6a = 4 - 2a$

$4a = 2 \Rightarrow \boxed{a = \frac{1}{2}}$

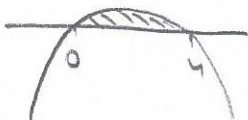
$f(x) = \ln\left(2x - \frac{x^2}{2}\right)$

$$f'(x) = \frac{4 - 2x}{4x - x^2}$$

2) $: \text{הגדרת } f$

$2x - \frac{x^2}{2} > 0 \quad / \cdot 2$

$4x - x^2 > 0$



$$0 < x < 4$$

3) $x \text{ נ"ר } 0 \text{ ונ"ר } 4$

$f=0 \quad \ln\left(2x - \frac{x^2}{2}\right) = 0 \Rightarrow 2x - \frac{x^2}{2} = 1 \quad / \cdot 2$

$4x - x^2 = 2 \Rightarrow x^2 - 4x + 2 = 0$

$x_{1,2} = \frac{4 \pm \sqrt{8}}{2} \rightarrow x_1 = 3.41 \Rightarrow \boxed{(3.41, 0)}$
 $\rightarrow x_2 = 0.58 \Rightarrow \boxed{(0.58, 0)}$

מציאת נק' קיצון

$$F'(x) = 0 \Rightarrow 4 - 2x = 0 \Rightarrow x = 2$$

$$F(2) = \ln 2 \quad (2, \ln 2)$$

	x	0	0 < x < 2	2	2 < x < 4	4
סימן הנגזרת	-	-	+	-	-	-
התנהגות הפונקציה	-	-	↗	max	↘	-

לפי הנתונים הנ"ל אנו יכולים לומר כי הפונקציה היא קבועה (כלומר, אין לה נק' קיצון).

$$F'(1) = \frac{2}{(1)} = 2$$

$$F'(3) = \frac{-2}{(3)} = -\frac{2}{3}$$

$$\Rightarrow \boxed{\max(2, \ln 2)}$$

הפונקציה היא קבועה (כלומר, אין לה נק' קיצון).
III