

$$① a_{n+1} = a_n - 4$$

$$\Rightarrow a_{n+1} - a_n = -4$$



סדרה חשבונית - הפרש -4

$$a_3 = 12 \Rightarrow a_1 + 2d = 12$$

$$d = -4$$

$$\Rightarrow a_1 = 20$$

לפי

$$n = 71$$

$$S_{71} - S_{61} = \left[2 \cdot 20 + 70 \cdot (-4) \right] \cdot \frac{71}{2} - \left[2 \cdot 20 + 60 \cdot (-4) \right] \cdot \frac{61}{2}$$

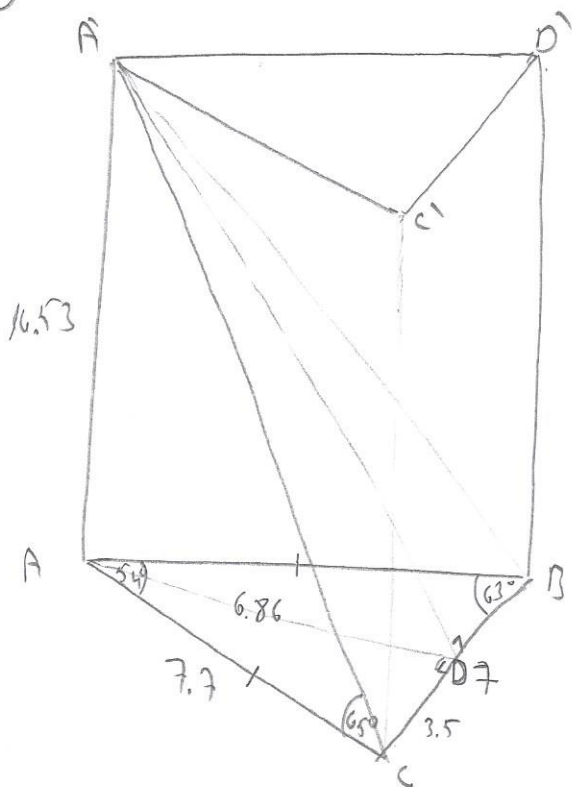
$$-8520 + 6100 = -2420$$

לפי

$$a_{36} - a_1 = 35d = 20 + 35 \cdot (-4) = -120$$

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1) $\triangle ABC \cong \triangle A'B'C'$ נכון / נכון / נכון

2) $AB = AC$ נכון

3) $\angle BAC = 54^\circ$ נכון

4) $BC = 7 \text{ cm}$

5) נכון כי $\triangle ABC$ ונכון $\triangle A'C$ נכון כי AC משותף ונכון $\angle A'CA = 65^\circ$

$\Rightarrow \angle A'CA = 65^\circ$

6) $\angle ABC = \angle ACB = 63^\circ$ (נכון כי $\triangle ABC \approx 10.3$ נכון + 3,2 נכון
180° $\triangle ABC \approx 5 = 170 + 10.3$)

7) $\triangle ABC$

$$\frac{AC}{\sin 63} = \frac{7}{\sin 54}$$

$$\Rightarrow AC = \frac{7 \cdot \sin 63}{\sin 54} = 7.7 \text{ cm}$$

(נכון / נכון)

8) $\triangle A'AC$

$$\frac{A'A}{7.7} = \tan 65 \Rightarrow A'A = 7.7 \cdot \tan 65 = 16.53 \text{ cm}$$

←

$$S_{\Delta C \hat{C} \hat{A}} = AC \cdot \hat{A}A = 7.7 \cdot 16.53 = 127.3 \text{ cm}^2$$

לפי

9) AA — מרחק?

10) $\angle \hat{A}AB = \angle \hat{A}AC = 90^\circ$ (זווית ישרה)

11) $\Delta \hat{A}AC \cong \Delta \hat{A}AB$ (משפטים 1, 2, 3)

12) $\hat{A}C = \hat{A}B$ (משפטים 1, 2, 3)

13) $\hat{A}D \perp BC$ (נניח)

14) $CD = DB = 3.5 \text{ cm}$ (נתון)
האם זה מיומן?

15) $AD \perp BC$ (משפטים 1, 2, 3)
זה נובע.

16) ΔADC
 $AD = \sqrt{7.7^2 - 3.5^2} = 6.86 \text{ cm}$ (משפטים 1, 2, 3)

17) הציגו בן $\hat{A}$ זמן מסתחב (הא)
הציגו בן $\hat{A}$ זמן מסתחב (הא)
 $\angle \hat{A}DA$

$\Delta \hat{A}AD$
 $\frac{16.53}{6.86} = \tan \angle \hat{A}DA \Rightarrow \angle \hat{A}DA = 67.46^\circ$
לפי

$$③ \quad f(x) = 3 - \sin^2 x - \cos x \quad -\pi \leq x \leq \pi$$

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1) پیدا کردن

$$\begin{aligned} f'(x) &= -2\sin x \cos x + \sin x \\ f'(x) &= -\sin 2x + \sin x \end{aligned}$$

$$f'(x) = 0 \Rightarrow -2\sin x \cos x + \sin x = 0$$

$$\sin x (-2\cos x + 1) = 0$$

$$\sin x = 0$$

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

$$x = \pi k$$

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

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

$$k=0 \quad x = 0$$

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

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

$$k=1 \quad x = \pi$$

$$x = 2\frac{1}{3}\pi \quad \phi$$

$$x = 1\frac{2}{3}\pi \quad \phi$$

$$k=-1 \quad x = -\pi$$

$$x = -1\frac{2}{3}\pi \quad \phi$$

$$x = -2\frac{1}{3}\pi \quad \phi$$

$$f''(x) = -2\cos 2x + \cos x$$

$$f''(-\pi) = -2\cos(-2\pi) + \cos(-\pi) = -3 < 0 \Rightarrow \text{Max}$$

$$f''(-\frac{\pi}{3}) = -2\cos(-\frac{2\pi}{3}) + \cos(-\frac{\pi}{3}) = 1.5 > 0 \Rightarrow \text{Min}$$

$$f''(0) = -2\cos 0 + \cos 0 = -1 < 0 \Rightarrow \text{Max}$$

$$f''(\frac{\pi}{3}) = -2\cos \frac{2\pi}{3} + \cos \frac{\pi}{3} = 1.5 > 0 \Rightarrow \text{Min}$$

$$f''(\pi) = -2\cos 2\pi + \cos \pi = -3 < 0 \Rightarrow \text{Max}$$



$$F(-\pi) = 3 - \sin^2(-\pi) - \cos(-\pi) = 4 \Rightarrow$$

$$F(-\frac{\pi}{3}) = 3 - \sin^2(-\frac{\pi}{3}) - \cos(-\frac{\pi}{3}) = \frac{7}{4} \Rightarrow$$

$$F(0) = 3 - \sin^2 0 - \cos 0 = 2 \Rightarrow$$

$$F(\frac{\pi}{3}) = 3 - \sin^2 \frac{\pi}{3} - \cos \frac{\pi}{3} = \frac{7}{4} \Rightarrow$$

$$F(\pi) = 3 - \sin^2 \pi - \cos \pi = 4 \Rightarrow$$

$$\max(-\pi, 4)$$

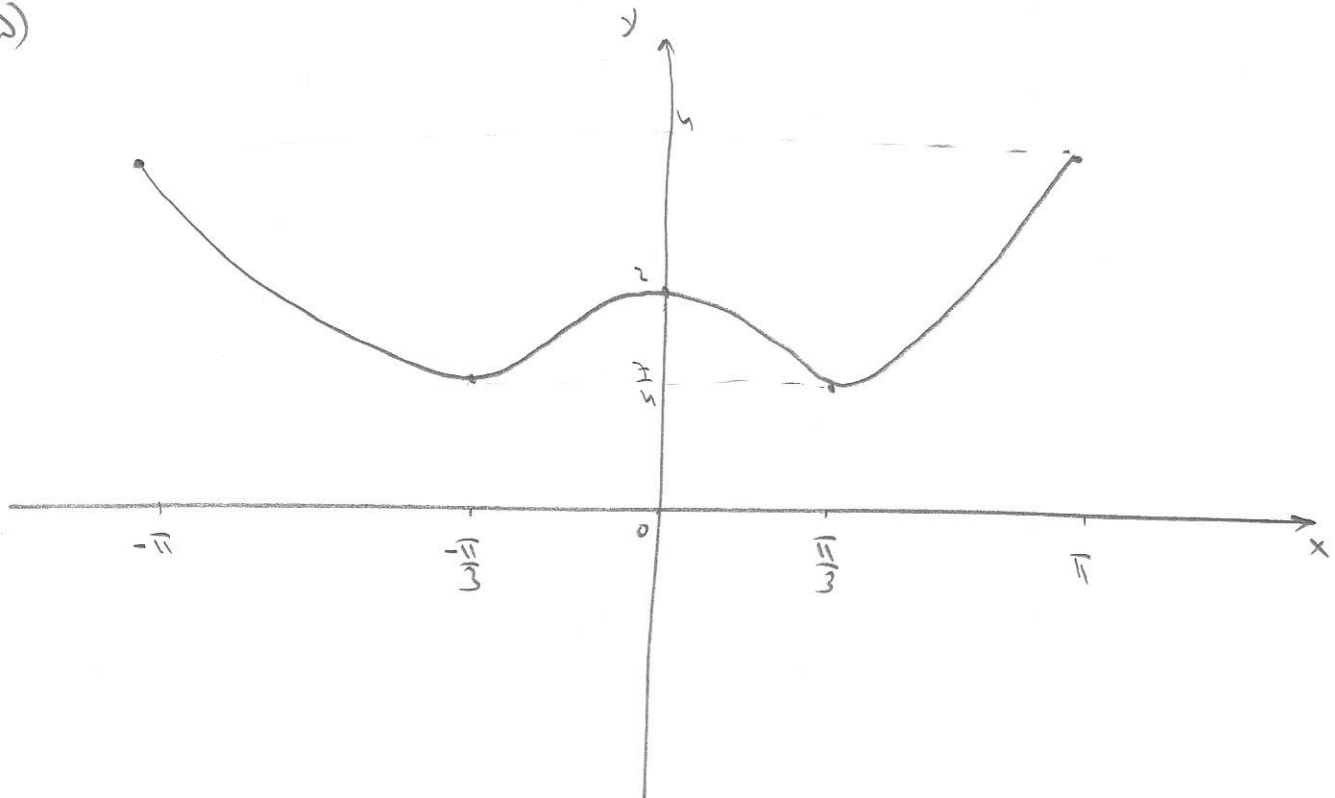
$$\min(-\frac{\pi}{3}, \frac{7}{4})$$

$$\max(0, 2)$$

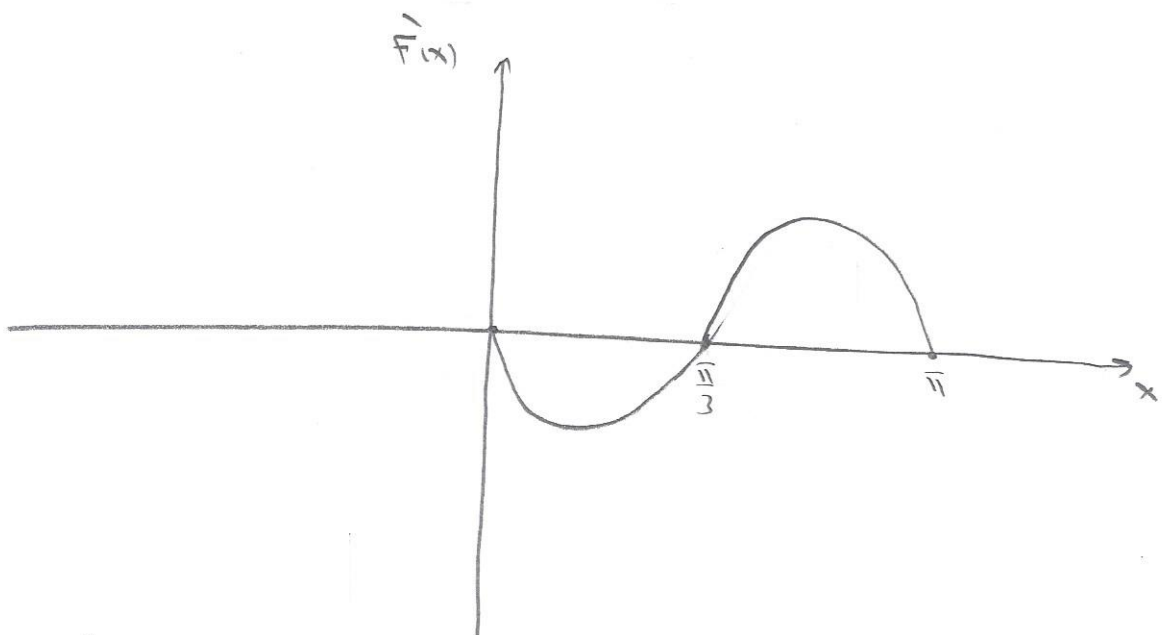
$$\min(\frac{\pi}{3}, \frac{7}{4})$$

$$\max(\pi, 4)$$

2)



3) u)



$$c) \quad 2) \quad S = \int_{\frac{\pi}{3}}^{\pi} f'(x) dx = \left[F(x) \right]_{\frac{\pi}{3}}^{\pi} = F(\pi) - F\left(\frac{\pi}{3}\right)$$

$$= 4 - \frac{7}{4} = \underline{\underline{\frac{9}{4}}}$$

4)

$$f(x) = e^x$$

$$g(x) = e^{3-x}$$

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1c)

$$\underline{f(x)}$$

x חיובי או שלילי

$$x=0 \Rightarrow e^x = 0 \quad \phi \quad \left(\begin{array}{l} e^x > 0 \\ x \text{ כל} \end{array} \right)$$

x חיובי או שלילי

$$x=0 \Rightarrow f(0) = 1 \Rightarrow \boxed{(0, 1)}$$

$$\underline{g(x)}$$

x חיובי או שלילי

$$x=0 \Rightarrow e^{3-x} = 0 \quad \phi \quad \left(\begin{array}{l} e^{3-x} > 0 \\ x \text{ כל} \end{array} \right)$$

x חיובי או שלילי

$$x=0 \Rightarrow f(0) = e^3 \Rightarrow \boxed{(0, e^3)}$$

2)

$$\underline{f(x)}$$

$$\boxed{\hat{f}(x) = e^x}$$

$$\hat{f}(x) = 0 \Rightarrow e^x = 0 \quad \phi \quad \begin{array}{l} e^x > 0 \\ x \text{ כל} \end{array}$$

|||

$$\boxed{x \text{ כל חיובי } f(x) \text{ יורד}}$$

$$\underline{g(x)}$$

$$\boxed{\hat{g}(x) = -e^{3-x}}$$

$$\begin{array}{l} e^{3-x} > 0 \\ x \text{ כל} \end{array} \Rightarrow -e^{3-x} < 0 \quad x \text{ כל}$$

|||

$$\boxed{x \text{ כל חיובי } g(x) \text{ יורד}}$$

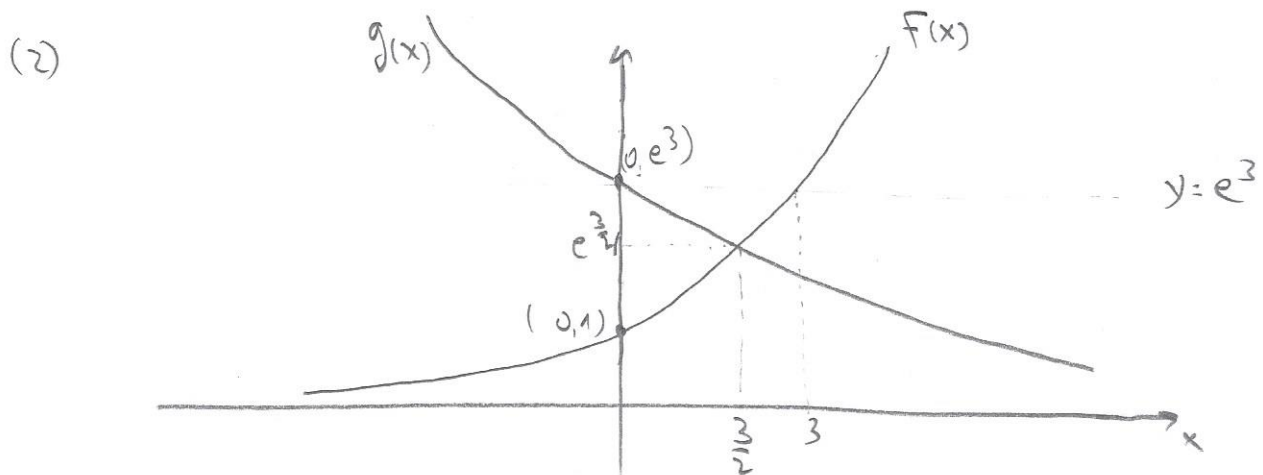
←

$$e)(1) \quad f(x) = g(x)$$

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

$$f\left(\frac{3}{2}\right) = e^{\frac{3}{2}}$$

$$\boxed{\left(\frac{3}{2}, e^{\frac{3}{2}}\right)} \quad \text{! } \text{min!}$$



$$(3) \quad S_1 = \int_0^{\frac{3}{2}} (e^3 - e^{3-x}) dx = \left[e^3 \cdot x + e^{3-x} \right]_0^{\frac{3}{2}} =$$

$$= \frac{3}{2}e^3 + e^{\frac{3}{2}} - e^3 = \frac{1}{2}e^3 + e^{\frac{3}{2}}$$

$$S_2 = \int_{\frac{3}{2}}^3 (e^3 - e^x) dx = \left[e^3 \cdot x - e^x \right]_{\frac{3}{2}}^3 =$$

$$= 3e^3 - e^3 - \left[\frac{3}{2}e^3 - e^{\frac{3}{2}} \right] = \frac{1}{2}e^3 + e^{\frac{3}{2}}$$

$$S = S_1 + S_2 = \frac{1}{2}e^3 + e^{\frac{3}{2}} + \frac{1}{2}e^3 + e^{\frac{3}{2}} = \underline{\underline{e^3 + 2e^{\frac{3}{2}}}} = \underline{\underline{29,05}}$$

3

$$F(x) = x^m - \ln(x^4) \quad x^m - m$$

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1) 287.1.1

$$x^4 > 0 \Rightarrow \boxed{x \neq 0}$$

2) $F'(x) = 0$ 1.1

$$F'(x) = m \cdot x^{m-1} - \frac{4x^3}{x^4}$$

$$\boxed{F'(x) = m \cdot x^{m-1} - \frac{4}{x}}$$

$$F'(x) = 0 \Rightarrow m - 4 = 0 \Rightarrow \boxed{m = 4}$$

$$F(x) = x^4 - \ln x^4$$

$$\boxed{F'(x) = 4x^3 - \frac{4}{x}}$$

c) 1.3.7 1.2

$$F'(x) = 0 \Rightarrow 4x^3 - \frac{4}{x} = 0$$

$$4x^4 = 4 \Rightarrow x^4 = 1 \Rightarrow x = \pm 1$$

$$F(1) = 1 \Rightarrow (1, 1)$$

$$F(-1) = 1 \Rightarrow (-1, 1)$$

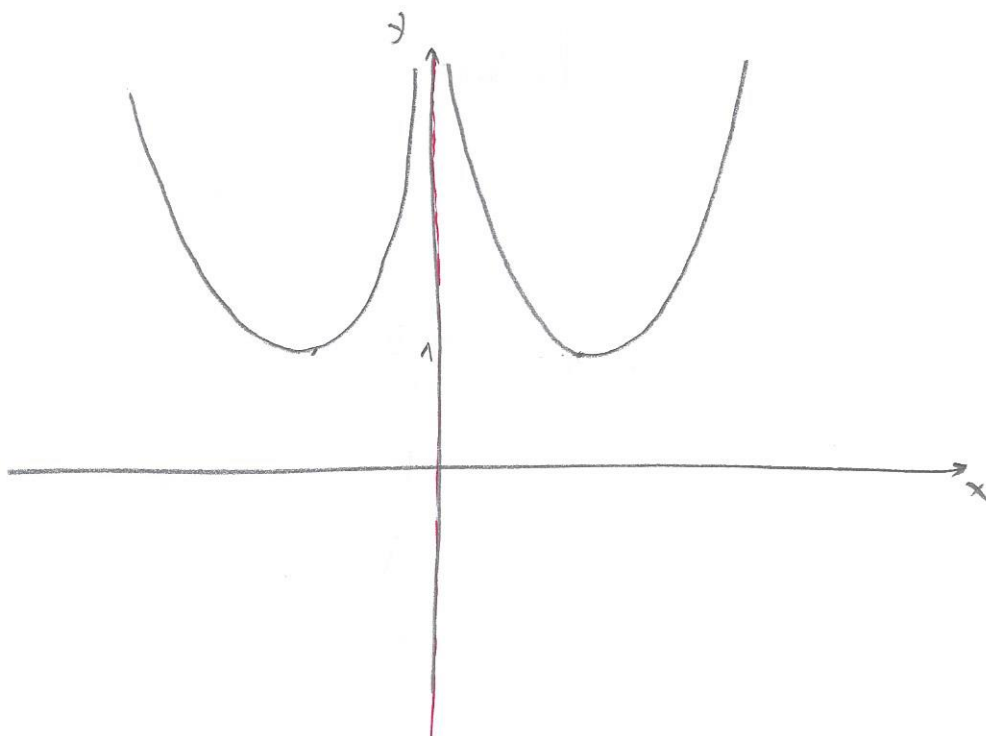
$$\boxed{F''(x) = 12x^2 + \frac{4}{x^2}}$$

$$F''(1) = 16 > 0 \Rightarrow \boxed{\min(1, 1)}$$

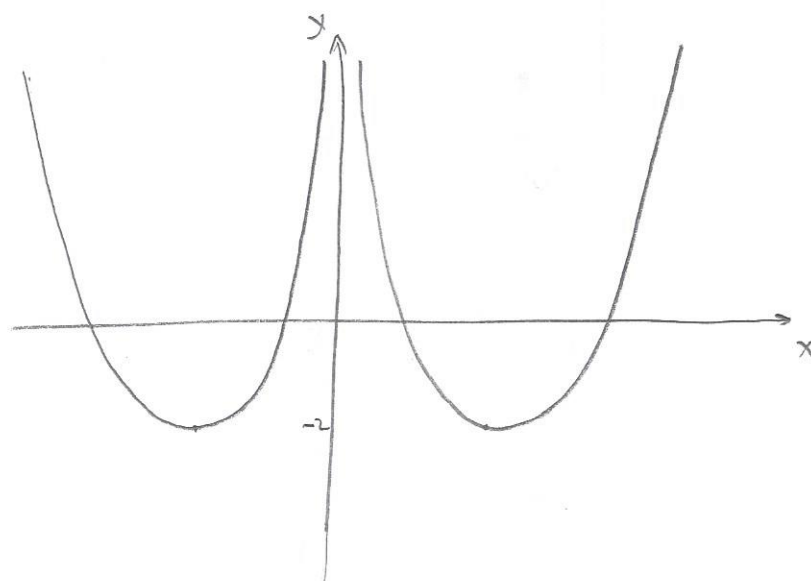
$$F''(-1) = 16 > 0 \Rightarrow \boxed{\min(-1, 1)}$$



3)



ה) $g(x) = f(x) - 3 \rightarrow$ $f(x)$ הוכח שהפונקציה $f(x)$ היא פונקציה זוגית



לפי המידע שניתן, הפונקציה $f(x)$ היא פונקציה זוגית