

1.82
1

⑩ $(m+1)x^4 - 2(m+3)x^2 + 3m+7 = 0$

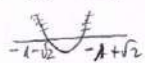
$x^2 = t$

$(m+1)t^2 - 2(m+3)t + 3m+7 = 0$

אם m שצולח את המשוואה הרישית אז $\Delta \geq 0$

$\Delta = 4(m^2 + 6m + 9) - 4(m+1)(3m+7) = 4m^2 + 24m + 36 - 12m^2 - 40m - 28 = -8m^2 - 16m + 8$

$0 < m^2 + 2m - 1$



$m > -1 + \sqrt{2}$
 $m < -1 - \sqrt{2}$

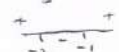
$0 < \Delta \iff -1 - \sqrt{2} < m < -1 + \sqrt{2}$

$0 < \frac{a}{b} = \frac{3m+7}{m-1}$



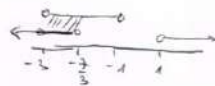
$m > -\frac{7}{3}$
 $m < 1$

$0 < \frac{a}{b} = \frac{2(m+3)}{m+1}$

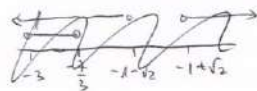


$-3 < m < -1$

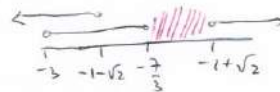
$-3 < m < -\frac{7}{3}$



מחזור



אם $\Delta < 0$ אז אין פתרונות



$-\frac{7}{3} < m < -1 + \sqrt{2}$

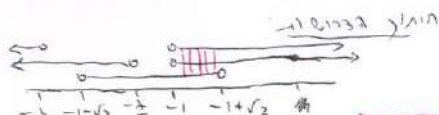
אם $\Delta < 0$ אז אין פתרונות

⑪

$0 < \Delta \rightarrow -1 + \sqrt{2} < m < -1 + \sqrt{2}$

$0 < \frac{a}{b} \rightarrow m < -\frac{7}{3}$ ו/או $m > 1$

$0 < \frac{a}{b} \rightarrow m < -3$ ו/או $m > -1$



$-1 < m < -1 + \sqrt{2}$

אם $\Delta < 0$ אז אין פתרונות

$x_1^2 + x_2^2 + x_3^2 + x_4^2 = 3$

$t_1 + t_1 + t_2 + t_2 = 3$

$2t_1 + 2t_2 = 3$

$t_1 + t_2 = \frac{3}{2}$

$\frac{2(m+3)}{m+1} = \frac{3}{2}$

$4m+12 = 3m+3$

$m = -9$

אם $\Delta < 0$ אז אין פתרונות

אם $\Delta < 0$ אז אין פתרונות

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1.2 I

$$\begin{cases} 2y = 5 - |x+1| \\ 4y^2 = |x| + 8 \end{cases}$$

$$(5 - |x+1|)^2 = |x| + 8$$

$$25 - 10|x+1| + (x+1)^2 = |x| + 8$$

$$x^2 + 2x + 18 - 10|x+1| - |x| = 0 \quad \text{[Case 1: } x \leq -1]$$

$$x^2 + 2x + 18 + 10x + 10 + x = 0$$

$$x^2 + 13x + 28 = 0$$

$$x_{1,2} = \frac{-13 \pm \sqrt{169 - 112}}{2} = \frac{-13 \pm \sqrt{57}}{2}$$

! y אב אפס (3) אפס אפס

$$\left(\frac{-13 + \sqrt{57}}{2}, \frac{\sqrt{57} - 1}{4} \right) \quad \left(\frac{-13 - \sqrt{57}}{2}, \frac{-1 - \sqrt{57}}{4} \right)$$

$$x^2 + 2x + 18 - 10x - 10 + x = 0$$

$-1 < x \leq 0$

$$x^2 - 7x + 8 = 0$$

$$\frac{7 \pm \sqrt{49 - 32}}{2} = \frac{7 \pm \sqrt{17}}{2}$$

↑
if
every

$0 \leq x$

$$x^2 + 2x + 18 - 10x - 10 - x = 0$$

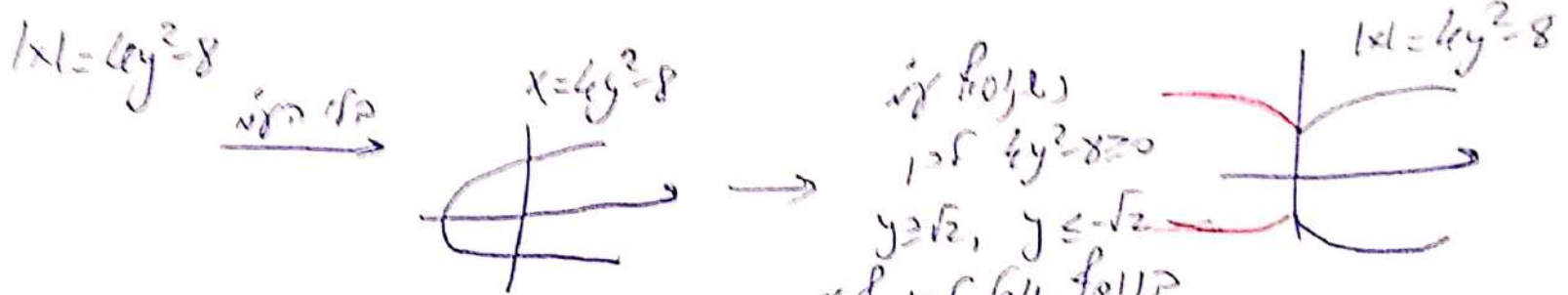
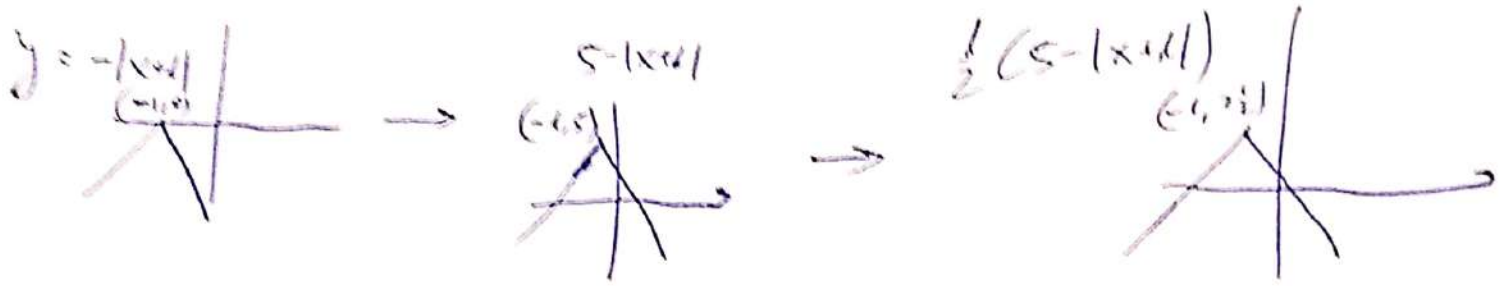
$$x^2 - 9x + 8 = 0$$

$$x = 1, 8$$

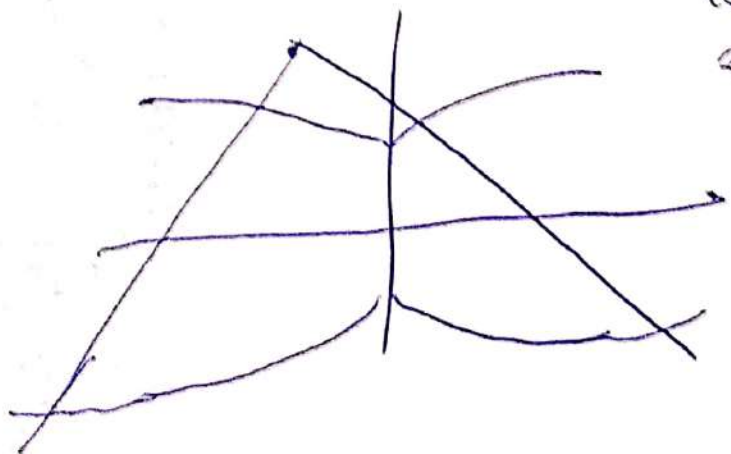
$$\left(1, \frac{1}{2} \right) \quad (8, -2)$$

אפס אפס

II $y = \frac{1}{2}(5 - |x+1|)$
 אפילו אפילו



אם $4y^2 - 8 \geq 0$
 $y \geq \sqrt{2}, y \leq -\sqrt{2}$
 קווי פרבולה פתוחים למעלה
 x אפילו (אפילו) אפילו אפילו
 אפילו אפילו אפילו



אם $4y^2 - 8 < 0$
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1.82
k3

$$y = \log_{x+3} \left(2^{2^x} - \frac{11}{3} \cdot 6^x + 2 \cdot 3^{2^x} \right)$$

תחום מוגדר

$$\boxed{-2 \neq x > -3} \leftarrow 1 \neq x+3 > 0$$

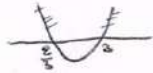
א"ל

$$2^{2^x} - \frac{11}{3} \cdot 6^x + 2 \cdot 3^{2^x} > 0 \quad / : 3^{2^x}$$

$$\left(\frac{2}{3}\right)^{2^x} - \frac{11}{3} \cdot \left(\frac{2}{3}\right)^x + 2 > 0$$

$$t^2 - \frac{11}{3}t + 2 > 0$$

$$3t^2 - 11t + 6 > 0$$



$$\boxed{x > 1}$$

$$\boxed{-3 < x < \log_{\frac{2}{3}} 3}$$

$$\left(\frac{2}{3}\right)^x = t$$

1/0) $0 < t \leq 1$

$$t > 3 \rightarrow \left(\frac{2}{3}\right)^x > 3 \rightarrow \boxed{x < \log_{\frac{2}{3}} 3}$$

$$0 < t < \frac{2}{3} \rightarrow 0 < \left(\frac{2}{3}\right)^x < \frac{2}{3} \rightarrow \boxed{x \geq 1}$$

תחום מוגדר
1. -2

א"ל תחום מוגדר של הפונקציה

תחום מוגדר

$$\begin{aligned} \left(\frac{1}{9}\right)^{\frac{3}{2} \log_{\frac{3}{9}} \sqrt{x+3}} &= -2x - \frac{3}{2} \\ \left(\frac{1}{9}\right)^{\frac{3}{2} \log_{3^{-1/2}} \sqrt{x+3}} &= -2x - \frac{3}{2} \\ \left(\frac{1}{9}\right)^{\frac{3}{2} \cdot \left(-\frac{2}{3}\right) \log_3 (x+3)^{0.5}} &= -2x - \frac{3}{2} \\ (3^{-2})^{0.5 \cdot \log_3 (x+3)} &= -2x - \frac{3}{2} \end{aligned}$$

$$\begin{aligned} x+3 &> 0 \\ x &> -3 \end{aligned}$$

$$\begin{aligned} \left(\frac{1}{3}\right)^{0.5 \cdot \log_3 (x+3)} &= -2x - \frac{3}{2} \\ \frac{1}{x+3} = -2x - \frac{3}{2} & \quad \left| \cdot 2(x+3) \right. \end{aligned}$$

$$\begin{aligned} (3^{-2})^{-0.5 \cdot \log_3 (x+3)} &= -2x - \frac{3}{2} \\ 3^{\log_3 (x+3)} &= -2x - \frac{3}{2} \\ x+3 &= -2x - \frac{3}{2} \\ 3x &= -4\frac{1}{2} \rightarrow x = -1\frac{1}{2} \end{aligned}$$

$$\frac{1}{x+3} = -2x - \frac{3}{2} \quad \left| \cdot 2(x+3) \right. \rightarrow 2 = -4x^2 - 12x - 3x - 9 \rightarrow 4x^2 + 15x + 11 = 0$$

$$\begin{aligned} \boxed{x = -1} \quad \text{p/s } 106 \end{aligned}$$

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(a)

$$a_k + a_{n-k+1} = a_1 + d(k-1) + a_1 + d(n-k+1-1) = 2a_1 + d(n-1)$$

$$= a_1 + a_n + d(n-1) = a_1 + a_n$$

(p)

$$q = \frac{a_2}{a_1} = \frac{\frac{1}{3-\sqrt{3}}}{\frac{1}{\sqrt{3}+1}} = \frac{\sqrt{3}-1}{(3-\sqrt{3})(\sqrt{3}+1)} = \frac{\sqrt{3}-1}{\sqrt{3}(\sqrt{3}-1)(\sqrt{3}+1)} = \frac{1}{\sqrt{3}(\sqrt{3}+1)}$$

$0 < q < 1$ \therefore $\sum_{k=1}^{\infty} a_k$ \therefore $\sum_{k=1}^{\infty} a_k$ \therefore $\sum_{k=1}^{\infty} a_k$

$$S = \frac{a_1}{1-q} = \frac{\frac{1}{\sqrt{3}-1}}{1 - \frac{1}{\sqrt{3}(\sqrt{3}+1)}} = \frac{\frac{1}{\sqrt{3}-1}}{\frac{\sqrt{3}(\sqrt{3}+1) - 1}{\sqrt{3}(\sqrt{3}+1)}} = \frac{\sqrt{3}(\sqrt{3}+1)(\sqrt{3}+1)}{(\sqrt{3}-1)(\sqrt{3}(\sqrt{3}+1) - 1)} =$$

$$\frac{\sqrt{3}(3+2\sqrt{3}+1)}{(\sqrt{3}-1)(3+\sqrt{3}-1)} = \frac{\sqrt{3}(4+2\sqrt{3})}{(\sqrt{3}-1)(2+\sqrt{3})} = \frac{2\sqrt{3}(2+\sqrt{3})}{(\sqrt{3}-1)(2+\sqrt{3})} = \frac{2\sqrt{3}}{\sqrt{3}-1} \cdot \frac{\sqrt{3}+1}{\sqrt{3}+1} = \frac{2\sqrt{3}(\sqrt{3}+1)}{3-1} =$$

$$\frac{2(3+\sqrt{3})}{2} = 3+\sqrt{3}$$

(c)

$$S = 1 + 2 \cdot 3 + 3 \cdot 7 + \dots + n(2^n - 1)$$

$$= (1 \cdot 2 - 1) + (2 \cdot 2^2 - 2) + (3 \cdot 2^3 - 3) + \dots + (n \cdot 2^n - n)$$

$$= \underbrace{(1 \cdot 2 + 2 \cdot 2^2 + 3 \cdot 2^3 + \dots + n \cdot 2^n)}_{\substack{\text{נסתקב} \\ S^* \text{ נוסף}}} - \underbrace{(1 + 2 + \dots + n)}_{\substack{\text{סדרה חשבונית} \\ \frac{n(n+1)}{2}}}$$

$$S^* = 1 \cdot 2 + 2 \cdot 2^2 + \dots + n \cdot 2^n$$

$$2S^* = 1 \cdot 2^2 + 2 \cdot 2^3 + \dots + n \cdot 2^{n+1}$$

$$-S^* = 1 \cdot 2 + 1 \cdot 2^2 + 1 \cdot 2^3 + \dots + 1 \cdot 2^n - n \cdot 2^{n+1}$$

$$S^* = -(1 \cdot 2 + 1 \cdot 2^2 + 1 \cdot 2^3 + \dots + 2^n) + n \cdot 2^{n+1}$$

$$S^* = -\frac{2(2^n - 1)}{2-1} + n \cdot 2^{n+1} = -2^{n+1} + 2 + n \cdot 2^{n+1} = 2^{n+1}(n-1) + 2$$

$$S = 2^{n+1}(n-1) + 2 - \frac{n(n+1)}{2}$$

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$\triangle OAB$? איזו צורה $FE \perp$

$$FE = \frac{1}{2} AB$$

$\triangle ABC$? איזו צורה $G-D$

$$GD = \frac{1}{2} AB$$

$$FE = GD \quad \text{?}$$

$$FE \parallel GD \parallel AB$$

אז $FEDG$

$$OC \perp AB \iff \text{משפט } BOAC$$

($\triangle AOC$? איזו צורה) $DE \parallel OC$

אז $\angle OKA = 90^\circ = \angle FED$
(הקבועים הם זהים)

\Downarrow
אז $FE = GD = EG \iff$ $FEDG$ ריבוע

$\triangle ABC$ הוא איזו צורה $\angle A = 90^\circ$!
אז $OC \perp AB$ ומכאן $OC = \frac{1}{2} AB$

$$FE = \frac{1}{2} AB, \quad DE = \frac{1}{2} OC$$

אז $FEDG$ הוא ריבוע

אז $DF \perp EG$ ומכאן DF הוא האמצע של EG