

$$\frac{1}{1} \left\{ \log_5 (5+2x) \cdot \log_5 (1+4y) - \log_5 (3x-2y+7) = 2 \right.$$

$$\sqrt{y^2 - 2x} = y - x$$

$$y^2 - 2x = y^2 - 2yx + x^2$$

$$x^2 (x+2-2y) = 0$$

$$\downarrow \quad \downarrow$$

$$x=0 \quad x=-2+2y$$

$x=0$ תוצאה חלופית > 2 ?

$$\log_5 5 \cdot \log_5 (1+4y) - \log_5 (7-2y) = 2$$

$$\log_5 (1+4y) - \log_5 (7-2y) = 2$$

$$\log_5 \left(\frac{1+4y}{7-2y} \right) = 2$$

$$\frac{1+4y}{7-2y} = 25 \rightarrow 1+4y = 175 - 50y$$

$$54y = 174$$

$$y = \frac{174}{54} = \frac{29}{9}$$

$$(0, \frac{29}{9})$$

$x=-2+2y$ תוצאה חלופית > 2 ?

$$\log_5 (5-4+4y) \cdot \log_5 (1+4y) - \log_5 (-6+6y-2y+7) = 2$$

$$\log_5^2 (1+4y) - \log_5 (1+4y) = 2$$

$$A^2 - A - 2 = 0$$

$$A=2 \rightarrow \log_5 (1+4y) = 2 \rightarrow 1+4y = 25 \rightarrow y=6 \rightarrow x=10$$

$$A=-1 \rightarrow \log_5 (1+4y) = -1 \rightarrow 1+4y = \frac{1}{5} \rightarrow y = -\frac{1}{5} \rightarrow x = -2\frac{2}{5}$$

תוצאה חלופית
(10, 6)
(-2\frac{2}{5}, -\frac{1}{5})

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(10)

$$-3 = a_1 - a_3 = a_1 - a_1 q^2$$

$$6 = a_4 - a_2 = a_1 q^3 - a_1 q$$

$$-3 = a_1(1 - q^2)$$

$$6 = a_1 q(q^2 - 1)$$

$a_1 q \neq 0$ מכאן נניח $a_1 \neq 0$ ונחלק את המשוואה השנייה בשנייה הראשונה

$$\frac{-3}{6} = \frac{a_1(1 - q^2)}{a_1 q(q^2 - 1)} = -\frac{1}{q}$$

$q = 2$ $a_1 = 1$

$$\begin{aligned} S_5 &= S_{6-10} = \frac{a_1(q^5 - 1)}{q - 1} = \\ &= \frac{1 \cdot 2^5(2^5 - 1)}{2 - 1} = \frac{4 \cdot 2^5(2^5 - 1)}{2 - 1} = \\ &= 32 \cdot 31 = 992 \end{aligned}$$

(3)

$$11^2 + 12 = 133$$

מתחילת $n=1$
133 ?

נראה שהסדרה נכונה לכל n סקצ
נניח ונראה שהיא נכונה ל- $n+1$

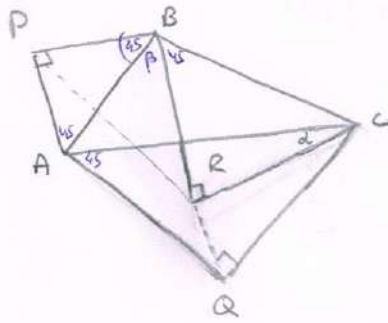
$$11^{n+3} + 12^{2n+3} = 11 \cdot 11^{n+2} + 12 \cdot 12^{2n+2}$$

$$= 12^2 (11^{n+2} + 12^{2n+2}) - 133 \cdot 11^{n+1}$$

מתחילת $n=1$
133 ?
אם הנחה

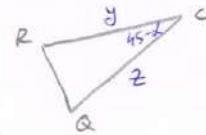
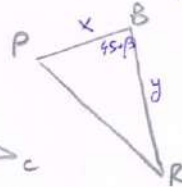
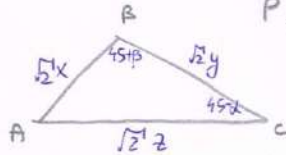
מתחילת $n=1$
133 - ?

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$PB = PA = x$
 $AB = \sqrt{2}x$
 $BR = RC = y$
 $BC = \sqrt{2}y$
 $AQ = QC = z$
 $AC = \sqrt{2}z$

אנחנו מנסים לראות שיש לנו 3 זוויות



(3.5.3) $\triangle ABC \sim \triangle PBR$

(3.5.3) $\triangle ABC \sim \triangle RCB$

$RQ = x, PR = z$ ← מילת התיאור

∴ (3.3.3) $\triangle PBR \cong \triangle RQC$

2 זוויות שוות $\triangle PRA$
 אז $PA = x = PR$
 אז $PR = z = AQ$

$\leftarrow PA = x = PR$
 $PR = z = AQ$

∴

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$$\textcircled{1} \quad 0 \neq \Delta = \begin{vmatrix} 2m-3 & -m \\ 5 & -(2m+3) \end{vmatrix} = -(4m^2-9) + 5m$$

$$\begin{aligned} 0 &\neq 4m^2 - 5m - 9 \\ 0 &\neq 4m^2 - 9m + 4m - 9 \\ 0 &\neq 4m(m+1) - 9(m+1) \\ 0 &\neq (4m-9)(m+1) \\ m &\neq -1, \frac{9}{4} \end{aligned}$$

על מנת שיש פתרון ייחודי
צריך שיהיה $\Delta \neq 0$

$$m = -1$$

$$\begin{cases} -5x + y = -5 \\ 5x - y = 5 \end{cases}$$

$$\begin{aligned} &\infty \text{ ערכים} \\ &: m = \frac{9}{4} \end{aligned}$$

$$\begin{cases} 1.5x - 2\frac{1}{2}y = 4\frac{1}{2} \\ 5x - 7\frac{1}{2}y = 5 \end{cases}$$

אין פתרון

x=1

$$\begin{cases} (2m-3) - my = 3m-2 \\ 5 - (2m+3)y = 5 \end{cases}$$

$$-(2m+3)y = 0$$

$$m = -\frac{1}{2}$$

$$-6 - 1\frac{1}{2}y = -5$$

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

$$y = 0$$

$$2m-3 = 3m-2$$

$$m = -1$$

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$$\left(\frac{1}{8}\right)^a \leq 2 \frac{ax^2+a^2x-2a}{x^2-x+1} \leq 8 \frac{2a}{a^2}$$

$$2^{-3a} \leq 2 \frac{ax^2+a^2x-2a}{x^2-x+1} \leq 2^{2a}$$

$$-3a \leq \frac{ax^2+a^2x-2a}{x^2-x+1} \leq 2^{2a}$$

$$\downarrow \downarrow \quad -3ax^2+3ax-3a \leq ax^2+a^2x-2a \quad \text{or} \quad ax^2+a^2x-2a \leq 2ax^2-2ax+2a$$

$$0 \leq 4ax^2+x(a^2-2a)+a$$

$$\Delta \leq 0 \quad \text{or} \quad 4a > 0 \quad \text{and} \quad a > 0$$

$$(a^2-3a)^2 - 16a^2 < 0 \quad \text{or} \quad a > 0$$

$$(a^2-3a-4a)(a^2-3a+4a) < 0$$

$$(a^2-3a)(a^2+a) < 0$$

$$a(a-3)a(a+1) < 0$$

$$\boxed{-1 \leq a \leq 7}$$

inlyf mpt
piknd
a=0

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x fof mlti nj mnd

2 2

$$ax^2+a^2x-2a \leq 2ax^2-2ax+2a$$

$$0 \leq ax^2+x(a^2-2a)+4a$$

$$a > 0 \quad \text{or} \quad \Delta \leq 0$$

$$0 > \Delta = (-a^2-2a)^2 - 16a^2$$

$$0 > (-a^2-2a-4a)(-a^2-2a+4a) \quad (a > 0)$$

$$0 > (-a^2-6a)(-a^2+2a)$$

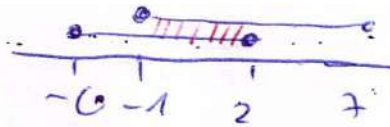
$$0 > -a(a+6)a(-a+2)$$

$$-6 \leq a \leq 2$$

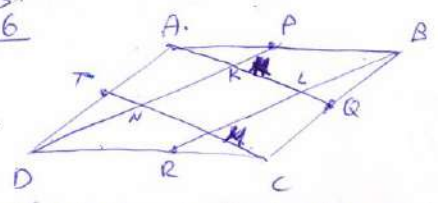
$$-6 \leq a \leq 2$$

מותר, הסימון

$$\boxed{-1 \leq a \leq 2}$$



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$\Delta AQC \cong \Delta BQD \Leftrightarrow TA = CQ$
 \Downarrow
 $AQ \parallel TC$
 $\Delta PBD \cong \Delta DRD \Leftrightarrow PB = DR$
 \Downarrow
 $PD \parallel BR$

$\Delta MKN \cong \Delta MNL \Leftrightarrow MN \parallel KL$
 $\Delta MKN \cong \Delta MNL \Leftrightarrow MN \parallel KL$
 $\Delta CNM \cong \Delta ANM \Leftrightarrow RM \parallel AN$

$2x = CM - NM$
 (S.S.S) $\Delta CND \cong \Delta BNA$

$2x = AK \Leftrightarrow \Delta BMC \cong \Delta AKC$
 $NT = \frac{1}{2} AK = x \Leftrightarrow \Delta AKD \cong \Delta KNT$

$CT = TN + NM + MC = 2x + 2x + x = 5x$
 $AN = 2x = \frac{2}{5} \cdot 5x = \frac{2}{5} DP$

$S_{PBRD} = h \cdot DR = h \cdot \frac{1}{2} DC$
 $= \frac{1}{2} (h \cdot DC) = \frac{1}{2} S$

$H \rightarrow$ (height) DP - R - N

$S_{PBRD} = \frac{1}{2} S = H \cdot DP$
 $S_{MLKN} = H \cdot NM = H \left(\frac{2}{5} DP\right)$

$\Rightarrow \frac{S_{MLKN}}{2} = H \cdot DP$
 $\frac{S_{MLKN}}{2} = S_{PBRD} = \frac{1}{2} S$
 $S_{MLKN} = \frac{2}{5} \cdot \frac{1}{2} S = \frac{1}{5} S$