

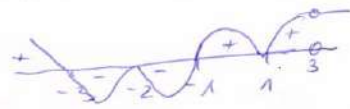
1.80
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I $\frac{(x+2)^2(x^2-8x)}{(x^2-4x+3)(x^2-1)} \geq 0$

$0 \leq \frac{(x+2)^2(x^2-9)(x^2+9)}{(x-3)(x-1)(x-1)(x+1)} = \frac{(x+2)^2(x-3)(x+3)(x^2+9)}{(x-3)(x-1)(x-1)(x+1)} =$

$0 \leq \frac{(x+2)^2(x+3)(x^2+9)}{(x-1)^2(x+1)}$

$x \neq 3$



$x > 3, 1 < x < 3, -1 < x < 1, x \geq -3$

II

$1 \leq |x-3| < 5$

$x > 3$

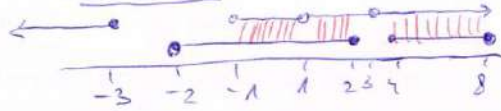
$1 \leq x-3 < 5$

$4 \leq x < 8$

$x \leq 3$

$1 \leq -x+3 < 5$

$-2 \leq x \leq 2$



number plane

$-1 < x < 1, 1 < x \leq 2, 4 \leq x \leq 8$

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$$16^a \cdot 2^{(a+1)x^2+1} < 2 \cdot 8^{ax}$$

$$2^{4a+(a+1)x^2+1} < 2^{1+3ax}$$

$$4a+(a+1)x^2+1 < 1+3ax$$

$$(a+1)x^2 - 3ax + 4a < 0$$

ישויות $\Delta < 0$ PH $0 < a+1$ pk

$$\boxed{-1 < a}$$

$$9a^2 - 16a(a+1) < 0$$

$$a(9a - 16a - 16) < 0$$

$$-a(7a + 16) < 0$$

$$\begin{array}{c} + \\ - \quad - \\ \frac{-16}{7} \quad 0 \end{array}$$

$$\boxed{a > \frac{-16}{7}, a > 0}$$



$$\boxed{a > 0}$$

$a = \frac{-16}{7}$ pk $0 = a$ pk $\Delta = 0$ pk

מתחילה $a = 0$ נחליף את המשוואה.

ישויות $\Delta = 0$ PH $0 < x^2 < 0$ pk pk

$$\boxed{a \geq 0}$$

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6, 66, 666, 6666, ...

* 60, 600, 6000

הצורה הכללית היא $6 \cdot 10^{n-1}$

$$a_n = 6 + S_{n-1}^*$$

$$= 6 + 60 \cdot \left[\frac{10^{n-1} - 1}{10 - 1} \right]$$

$$= 6 + \frac{60}{9} (10^{n-1} - 1) = \frac{54 + 60}{9} (10^{n-1} - 1)$$

$$= \frac{60 \cdot 10^{n-1} - 6}{9} = \frac{6 \cdot 10^n - 6}{9} =$$

$$= \frac{2 \cdot 10^n - 2}{3} = \frac{2}{3} (10^n - 1)$$

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$$\left(x^2 - \frac{3}{4}\right) \log_{x+2} \left(\frac{1}{3}\right) \geq \log_{x+2} (3^{2x})$$

$$\log_{x+2} \left(\frac{1}{3}\right)^{\left(x^2 - \frac{3}{4}\right)} \geq \log_{x+2} (3^{2x})$$

$$\log_{x+2} 3^{-\left(x^2 - \frac{3}{4}\right)} \geq \log_{x+2} (3^{2x})$$

$$3^{-x^2 - \frac{3}{4}} \geq 3^{2x}$$

$$-x^2 - \frac{3}{4} \geq 2x \quad | \cdot 4$$

$$0 \geq 4x^2 + 8x + 3$$



$$-\frac{3}{2} < x \leq -\frac{1}{2}$$

$$3^{-x^2 - \frac{3}{4}} \leq 3^{2x}$$

$$-x^2 - \frac{3}{4} \leq 2x \quad | \cdot 4$$

$$4x^2 + 8x + 6 \leq 0$$



$$x \geq -\frac{1}{2} \\ x \leq -\frac{3}{2}$$

$$\boxed{-2 < x \leq -\frac{3}{2}, -1 < x \leq -\frac{1}{2}}$$

מגבלות אחרות
 $1 + x + 2 > 0$
 $|-1 + x > -2|$

פירוק $x+2 > 1 \Rightarrow 0 < 1$
 $x > -1$

$$\boxed{-1 < x \leq -\frac{1}{2}}$$

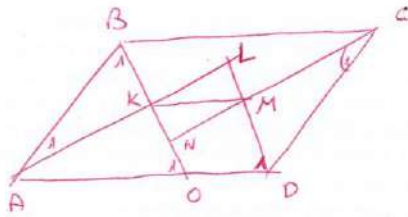
ik

פירוק $0 < x+2 < 1 \Rightarrow 0 < 0$
 $-2 < x < -1$

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

ישו מוגבלות אחרות אף מוגבלות

⊥



(1) $\angle A + \angle B = 180^\circ$ (supplementary angles)

$\frac{1}{2}\angle A + \frac{1}{2}\angle B = 90^\circ$

$\angle A_1 + \angle B_1 = 90^\circ$

$90^\circ = \angle AKB$

∠ ABO ∠ AKB

(2) $\angle O_1 = \angle B_1$

$\angle B = \angle D$

$\angle O_1 = \angle D_1 = \angle B_1 = \angle D$

$90^\circ = \angle KLD$

$90^\circ = \angle CHD$

∠ CHD ∠ AKB ∠ CHD = 90°

$AB = CD$ (given) $AB = AO$

(proved) $AB = CD$

$\angle CHD = \angle AKO$ $\angle AKB = \angle CHD = 90^\circ$

$\angle O = \angle O$

∠ CHD = ∠ AKO

$\angle K = \angle O$ \Rightarrow $\angle K = \angle O$

$AO = AO + OD$

$b = a + OD = KM$

$b - a = KM$

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المثلثين QPO و QPN - المثلث QPN قائم الزاوية O في ABC المثلث

$$\angle OAC = \alpha = \angle FAO$$

$$\angle ABD = \beta = \angle DBC$$

$$\left(\begin{array}{l} \text{في المثلث} \\ DC \end{array} \right) \angle DAC = \angle DBC = \beta$$

$$\left(\begin{array}{l} \text{في المثلث} \\ \triangle ABO \end{array} \right) \angle AOD = \angle ABO + \angle BAO = \alpha + \beta \quad \left. \begin{array}{l} \angle OAD = \angle OAC + \angle CAD = \alpha + \beta \\ \angle AOD = \angle ABO + \angle BAO = \alpha + \beta \end{array} \right\} AD = OD$$

$$\left(\text{AD في المثلث} \right) \angle AFD = \angle ABD = \beta \quad \rightarrow$$
$$\angle BEO = 90^\circ = \angle FAD$$

$$\downarrow$$
$$\triangle BEO \sim \triangle FAD$$

$$\downarrow$$
$$BO \cdot AD = OE \cdot FD \quad \leftarrow \quad \frac{BO}{FD} = \frac{OE}{AD}$$

$$OE \cdot FD = BO \cdot AD = BO \cdot OD = MO \cdot ON \quad \text{المثلث QPN قائم الزاوية O في}$$
$$\downarrow$$

المثلث QPN قائم الزاوية O في

$$MO \cdot ON = (R-l)(R+l) = R^2 - l^2$$

$$MO = 2R - ON = 2R - (R+l) = R-l$$

$$OE \cdot FD = r \cdot 2R$$

في المثلث QPN 3

$$\left. \begin{array}{l} MO \cdot ON = (R-l)(R+l) = R^2 - l^2 \\ MO = 2R - ON = 2R - (R+l) = R-l \end{array} \right\} 2Rr = R^2 - l^2$$