$$\log_p x + \log_{px} x > 0$$

1/3.22

$p > 1$

$$\log_p x + \frac{\log_p x}{\log_p px} > 0$$

$$\frac{\log_p px \cdot \log_p x + \log_p x}{\log_p px} > 0$$

$$\frac{(\log_p p + \log_p x)\log_p x + \log_p x}{\log_p p + \log_p x} = \frac{(1+\log_p x)\log_p x + \log_p x}{1+\log_p x} > 0$$

$$\frac{(1+t)t + t}{1+t} > 0$$

$$\frac{t^2+2t}{1+t} > 0 \qquad \frac{t(t+2)}{1+t} > 0$$

$-2 \quad -1 \quad 0$

$-2 < t < -1$

$-2 < \log_p x < -1$

$$\boxed{p^{-2} < x < p^{-1}}$$

$t > 0 \longrightarrow \log_p x > 0$

$$\boxed{x > 1}$$

$0<p<1$ ואותה הדרך, רק האי שוויון משתנה כי הבסיס קטן מ-1

$-2 < \log_p x < -1$

$$\boxed{p^{-1} < x < p^{-2}}$$

$\log_p x > 0$

$x < 1$

$0 < x < 1$

$$\boxed{x > 0}$$

ת"ל

דרך קצת שונה

3.22

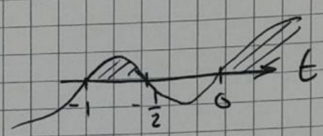
1. $\log_p x + \log_{px} x > 0$ $\qquad x > 0$ ת.ה:

$$\frac{1}{\log_x p} + \frac{1}{\log_x px} > 0$$

$$\frac{1}{\log_x p} + \frac{1}{\log_x p + 1} > 0$$

$$\frac{2\log_x p + 1}{\log_x p(\log_x p + 1)} > 0 \qquad \log_x p = t$$

$$\frac{2t+1}{t(t+1)} > 0$$



$$-1 < t < -\frac{1}{2} \quad \cup \quad t > 0$$

$$-1 < \log_x p < -\frac{1}{2} \quad \cup \quad \log_x p > 0$$

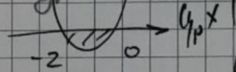
$$-1 < \frac{1}{\log_p x} < -\frac{1}{2} \quad \cup \quad \boxed{\log_p x > 0} \text{ .א}$$

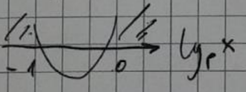
$$\frac{1}{\log_p x} > -1 \quad \cap \quad \frac{1}{\log_p x} < -\frac{1}{2}$$

$$\frac{\log_p p + \log_p x}{\log_p x} > 0 \qquad \frac{2 + \log_p x}{\log_p x} < 0$$

נסמן את $\log_p x$ כ t

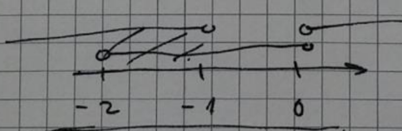
$$\frac{1 + \log_p x}{\log_p x} > 0$$





$$-2 < \log_p x < 0$$

$$\log_p x < -1 \quad \cup \quad \log_p x > 0$$



$$\boxed{-2 < \log_p x < -1} \text{ .ב}$$

$p > 1$

ת-א'

$$\boxed{\begin{array}{c} x > 1 \\ p^{-2} < x < p^{-1} \end{array}}$$

ת-ב'

$0 < p < 1$

ת-א'

$$\boxed{\begin{array}{c} 0 < x < 1 \\ p^{-1} < x < p^{-2} \end{array}}$$

ת-ב'