

תורת הגבול - 5 דברים

1.  $0 = 0 = 0$   $\alpha = \beta + 0$   $\alpha = \beta$   $\alpha = \beta + 0$

2.  $\alpha = 2 + 0$   $\alpha = \beta + n$

3.  $\alpha = \beta + n$   $\alpha = \beta + 0 = \beta$

4.  $\alpha = \beta + n$   $\alpha = \beta + 1 = \beta + (1 + 0)$

5.  $\alpha = \beta + n$   $\alpha = \beta + (n + 1) = \beta + (n + 1)$

6.  $\alpha = \beta + n$   $\alpha = \beta + (n + 1)$

7.  $\alpha = \beta + n$   $\alpha = \beta + (n + 1)$

8.  $\alpha = \beta + n$   $\alpha = \beta + (n + 1)$

9.  $\alpha = \beta + n$   $\alpha = \beta + (n + 1)$

10.  $\alpha = \beta + n$   $\alpha = \beta + (n + 1)$

11.  $\alpha = \beta + n$   $\alpha = \beta + (n + 1)$

12.  $\alpha = \beta + n$   $\alpha = \beta + (n + 1)$

13.  $\alpha = \beta + n$   $\alpha = \beta + (n + 1)$

14.  $\alpha = \beta + n$   $\alpha = \beta + (n + 1)$

15.  $\alpha = \beta + n$   $\alpha = \beta + (n + 1)$

$w = w$

$\alpha = w$   $\beta = w$

$f(w) = w \cdot w > w = \sup\{w\} = \sup\{n \cdot w \mid n \in \mathbb{N}\} = \sup\{f(n)\}$

16.  $\alpha = \beta + n$   $\alpha = \beta + (n + 1)$

17.  $\alpha = \beta + n$   $\alpha = \beta + (n + 1)$

18.  $\alpha = \beta + n$   $\alpha = \beta + (n + 1)$

19.  $\alpha = \beta + n$   $\alpha = \beta + (n + 1)$



...  $w \in \mathbb{R}$  ...

$f(w) = w$

$f(x) = w$  ...  $f(w) = w$  ...

$f(w+w) \leq w$

...  $w \in \mathbb{R}$  ...  $f(w+w) > w$  ...

$f(w+w) > w$

...  $f: \mathbb{R} \rightarrow \mathbb{R}$  ...  $\epsilon \in \mathbb{R}$  ...  $\delta \in \mathbb{R}$  ...

$\delta \in \mathbb{R} \Rightarrow f(x) \in \mathbb{R}$  ...

...  $f$  ...  $\delta \in \mathbb{R}$  ...

$\lim_{x \rightarrow \alpha} f(x) = \alpha$  ...

$\sup f(x) = \alpha$  ...

$\delta \in \mathbb{R}$  ...  $\epsilon \in \mathbb{R}$  ...  $f$  ...  $\delta \in \mathbb{R}$  ...

...  $\delta \in \mathbb{R}$  ...  $\epsilon \in \mathbb{R}$  ...

$\delta \in \mathbb{R} \Rightarrow f(x) \in \mathbb{R}$  ...

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$\sup f(x) \in \mathbb{R}$  ...

$\sup f(x) = \alpha$  ...

$\lim_{x \rightarrow \alpha} f(x) = \alpha$  ...

...  $\lim_{x \rightarrow \alpha} f(x) = \alpha$  ...  $\epsilon \in \mathbb{R}$  ...  $\delta \in \mathbb{R}$  ...

$f(x) = \alpha$  ...  $\delta \in \mathbb{R}$  ...

...  $\delta \in \mathbb{R}$  ...  $\epsilon \in \mathbb{R}$  ...

...  $f(x) \in \mathbb{R}$  ...  $\epsilon \in \mathbb{R}$  ...

...  $\lim_{x \rightarrow \alpha} f(x) = \alpha$  ...  $\epsilon \in \mathbb{R}$  ...  $\delta \in \mathbb{R}$  ...

$\delta \in \mathbb{R} \Rightarrow f(x) \in \mathbb{R}$  ...

$f(x) = 0$  ...

$f(x) = f(y) = \beta$  ...

$f(x) = \sup f(x)$  ...  $\delta \in \mathbb{R}$  ...  $\epsilon \in \mathbb{R}$  ...



לכיון שאיננו יכולים להשתמש במשפט הזה

$$\beta \cdot 0 = 0$$

אם  $\beta > 0$

אם  $\beta < 0$  - נשתמש במשפט הזה

$$f(\alpha+1) = \beta \cdot (\alpha+1) = \beta \cdot \alpha + \beta = f(\alpha) + \beta$$

אם  $\beta > 0$

אם  $\beta < 0$  - נשתמש במשפט הזה

$$f(\alpha) = \sup_{\gamma < \alpha} f(\gamma) = \sup_{\gamma < \alpha} \beta \gamma = \beta \cdot \alpha$$

$$\beta \cdot \sup_{\gamma < \alpha} \gamma = \beta \cdot \alpha$$

הערה