Rand, indre, ytre - punkt

Indre punkt hvis : A område , $B(\bar{a}, r)$ hvor $r > \varepsilon$

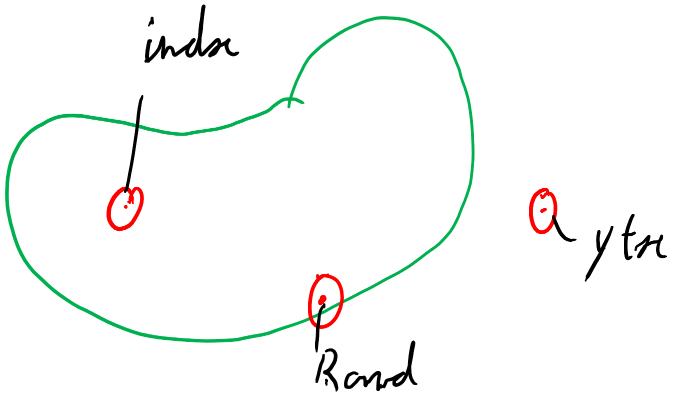
$$B(\bar{a}, r) \subseteq A$$

Rand punkt hvis :

Kulen $B(\bar{a}, r)$ inneholder punkter som er både inne i A og utenfor

Ytre punkt hvis

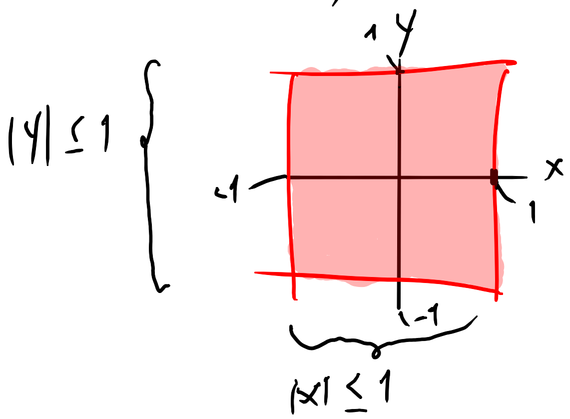
Kulen $B(\bar{a}, r) ? A$



K. 1.

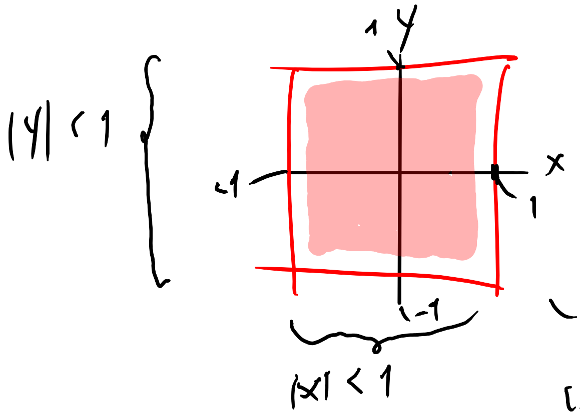
En mengde $A \subset \mathbb{R}^m$ er lukket dersom den inneholder alle sine randpunkter. Og åpen dersom den inneholder ingen

1 a) $\{(x, y) \in \mathbb{R}^2 : |x| \leq 1 \text{ og } |y| \leq 1\}$



lukket

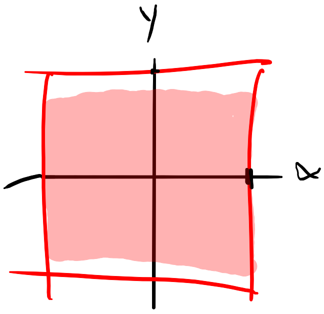
b) $\{(x, y) \in \mathbb{R}^2 : |x| < 1 \text{ og } |y| < 1\}$



åpen

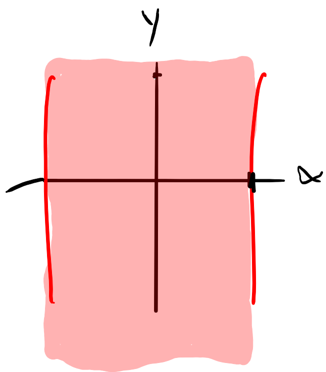
inneholder ikke randpunkter

c) $\{(x,y) \in \mathbb{R}^2 : |x| \le 1 \text{ og } |y| < 1\}$



lukket og åpen

d) $\{(x,y) \in \mathbb{R}^2 : |x| \le 1$



lukket

2 a) $\bar{x}_n = \left(\overset{a}{\frac{2n^2+1}{n^2+3n}}, \overset{b}{\frac{3n}{1-2n}} \right)$

$$a: \frac{\frac{2\cancel{n^2}}{\cancel{n^2}} + \frac{1}{n^2}}{\frac{\cancel{n^2}}{\cancel{n^2}} + \frac{3n}{n^2}} = 2, \quad b: \frac{\frac{3\cancel{n}}{\cancel{n}}}{\frac{1}{n} - \frac{2\cancel{n}}{\cancel{n}}} = -\frac{3}{2}$$

$x_n = (2, -\frac{3}{2})$

$$\text{b)}\quad x_n = \Big(\overset{a}{n \sin \tfrac{1}{n}},\ \overset{b}{n\,(1 - e^{2/n})}\Big)$$

$-1n^{-2}$

$-\frac{1}{n^2}$

$$a:\ \overset{\infty}{n}\,\overset{0}{\sin(1/n)} \overset{L'H}{=} \cos(1/n) \Rightarrow 1$$

$$\text{b)}\ (\overset{\infty}{n} - \overset{-\infty}{ne^{2/n}}) \overset{L'H}{=} 1 - n' \cdot e^{2/n} + ne^{2/n}(2/n)'$$

$$= 1 - e^{2/n} - \frac{\cancel{n}e^{2/n}}{n^{\cancel{2}}}$$

$$= \underset{1}{1} - \underset{1}{e^{2/n}} - \underset{0}{\frac{e^{2/n}}{n}} \Rightarrow 0$$

$1 - 1 - 0 = 0$

c

$$X_n =$$