

H2

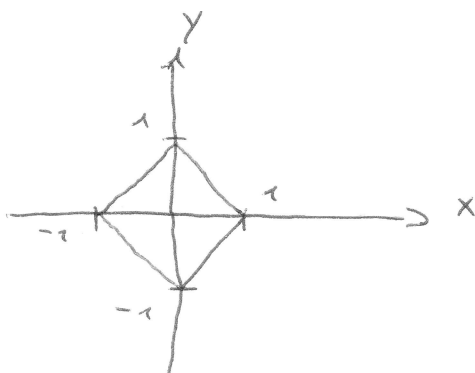
$$\begin{aligned} a) \quad \binom{n}{k} \binom{k}{j} &= \frac{n!}{(n-k)! k!} \frac{k!}{j! (k-j)!} \\ &= \frac{n! (n-j)!}{(n-k)! j! (k-j)! (n-j)!} \quad \begin{array}{l} \swarrow \\ (n-j)! \\ \text{erweitert} \end{array} \\ &= \frac{n!}{j! (n-j)!} \frac{(n-j)!}{(k-j)! \underbrace{(n-k)!}_{\substack{= \\ ((n-j)-(k-j))!}}} \\ \hookrightarrow \binom{n}{j} \binom{n-j}{k-j} \quad \begin{array}{l} \text{ist das das gleiche?} \end{array} \end{aligned}$$

$$\begin{aligned} b) \quad \binom{n}{k} \binom{n-k}{j} &= \frac{n!}{k! \cancel{(n-k)!}} \frac{\cancel{(n-k)!}}{j! ((n-k)-j)!} \\ &= \frac{n!}{k! j! (n-k-j)!} \quad \begin{array}{l} \swarrow \\ (n-j)! \\ \text{erweitert} \end{array} \\ &= \frac{n!}{j! (n-j)!} \frac{(n-j)!}{k! (n-k-j)!} \\ &= \binom{n}{j} \binom{n-j}{k} \end{aligned}$$

c) ?

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a) π_1

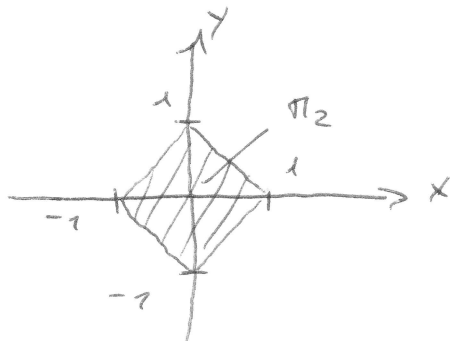


Ist nur eine Linie
von $x=1$ zu $y=1$
zu $x=-1$ zu $y=-1$

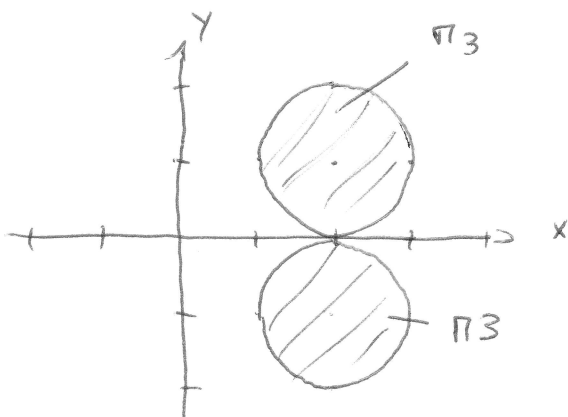
↳ keine Menge

?

b) π_2

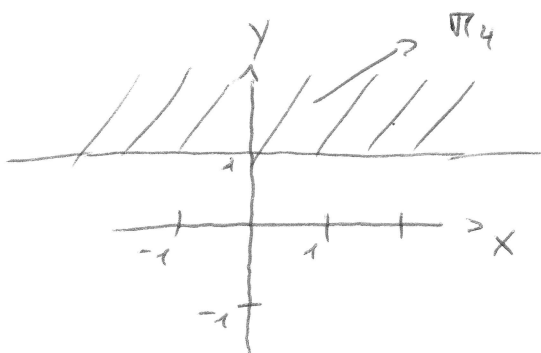


c) π_3

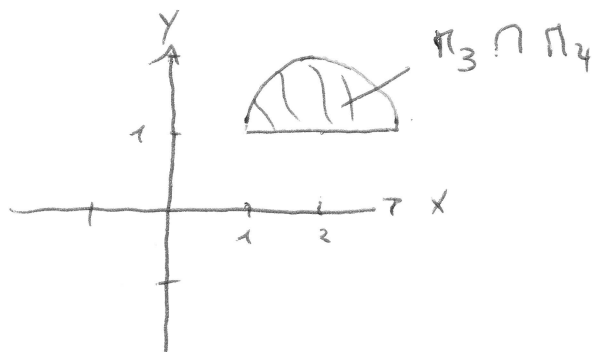


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d)



$\pi_3 \cap \pi_4$



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$$\begin{aligned} a) &= (2-3i)(3+2i) + \frac{(1+i)^2}{(1-i)^2} \\ &= 6+4i-9i+6 + \frac{\cancel{1+2i+1}}{\cancel{1-2i+1}} \quad \frac{+2i}{-2i} \\ &= 12-5i-1 \\ &= \underline{\underline{11-5i}} \end{aligned}$$

$$\begin{aligned} b) & (1+\sqrt{3}i)^3 + (1-\sqrt{3}i)^3 \\ &= 1 + 3\sqrt{3}i + 9i + 9i\sqrt{3} + 1 - 3\sqrt{3}i + 9i - 9i\sqrt{3} \\ &= \underline{\underline{2+18i}} \end{aligned}$$

$$\begin{aligned} c) & (1+i)^{10} \\ &= 1 + 10i - 45 - 120i + 210 + 252i - 210 - 120i \\ &\quad + 45 + 10i - 1 \\ &= \underline{\underline{32i}} \end{aligned}$$

$$d) \operatorname{Im}(2-4i) + \operatorname{Re}(15+2i)$$

?