

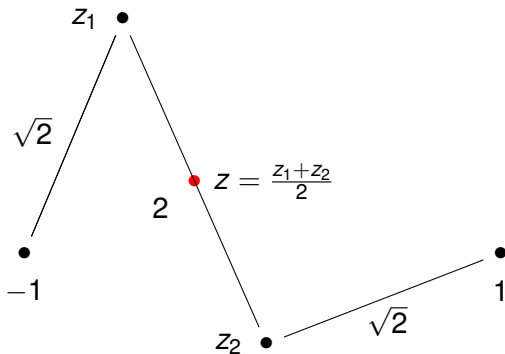


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Konstruksjon av rette linjer

March 3, 2016

Watt-kopling



$$|z_1 + 1| = \sqrt{2} \quad |z_1 - z_2| = 2 \quad |z_2 - 1| = \sqrt{2}$$

$$|z - (-1)| \cdot |z - 1| = |z + 1| \cdot |z - 1| = ?$$

$$(z_1 + 1)(\bar{z}_1 + 1) = z_1\bar{z}_1 + z_1 + \bar{z}_1 + 1 = 2$$

$$(z_2 - 1)(\bar{z}_2 - 1) = z_2\bar{z}_2 - z_2 - \bar{z}_2 + 1 = 2$$

$$(z_1 - z_2)(\bar{z}_1 - \bar{z}_2) = z_1\bar{z}_1 - z_1\bar{z}_2 - z_2\bar{z}_1 + z_2\bar{z}_2 = 4$$

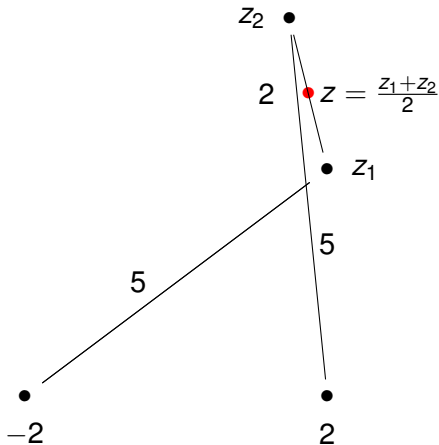
gir

$$|z + 1| \cdot |z - 1| = (z + 1)(\bar{z} + 1)(z - 1)(\bar{z} - 1) = 1$$

Uavhengig av z !

Men det røde punktet følger bare en tilnærmet rett linje.

Chebyshev-kopling



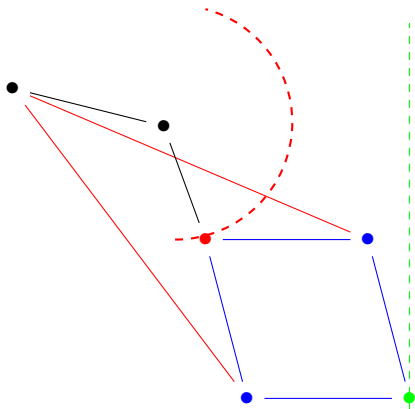
$$|z_1 + 2| = 5 \quad |z_1 - z_2| = 2 \quad |z_2 - 2| = 5$$

$$\Re(z) = \frac{z + \bar{z}}{2} = ?$$

Nesten uavhengig av z !

Mao. beskriver nesten en rett linje.

Peaucellier-Lipkin-kopling



La

$$z = a \cos \theta + a(1 + \sin \theta)i$$

Da er

$$\begin{aligned} \frac{1}{\bar{z}} &= \frac{1}{a \cos \theta - a(1 + \sin \theta)i} = \frac{a \cos \theta + a(1 + \sin \theta)i}{2a^2(1 + \sin \theta)} \\ &= \frac{z}{2a^2(1 + \sin \theta)} \end{aligned}$$

med imaginærdel

$$\Im\left(\frac{1}{\bar{z}}\right) = \frac{a(1 + \sin \theta)}{2a^2(1 + \sin \theta)} = \frac{1}{2a}$$



James Watt (1736-1819)



Pafnuty Chebyshev (1821-1894)

Sylvester sier om Lord Kelvin da han fikk se Peaucelliers konstruksjon:

He nursed it as if it had been his own child, and when a motion was made to relieve him of it, replied "No! I have not had nearly enough of it - it is the most beautiful thing I have ever seen in my life"