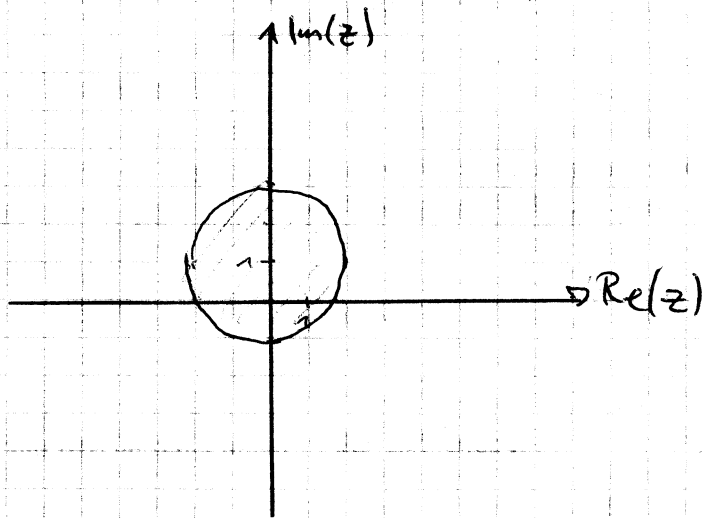


P4 a) $z_5 = 1 + \sqrt{3}i$

b) $z_6 = (6+4) + (12-2)i = 10 + 10i$

c) $z_7 = \frac{(1+2i)(3-6i)}{(3+6i)(3-6i)} = \frac{3+12+(6-4)i}{9+36} = \frac{1}{3}$

Klausur:
2 Seiten
handschriftlich



$$|z-i| = |x+iy-i| = |x+(y-1)i| = \sqrt{x^2 + (y-1)^2} = 2$$

$$x^2 + (y-1)^2 = 4$$

$$z = x+iy, \quad \operatorname{Re}\left(\frac{1}{z}\right) = \operatorname{Re}\left(\frac{1}{x+iy}\right) = \operatorname{Re}\left(\frac{x-iy}{(x+iy)(x-iy)}\right)$$

$$= \operatorname{Re}\left(\frac{x-iy}{x^2+y^2}\right) = \frac{x}{x^2+y^2}$$

$$\frac{x}{x^2+y^2} = 1 \quad x = x^2+y^2 \quad x^2-x+y^2 = 0 \quad \left(x-\frac{1}{2}\right)^2 - \frac{1}{4} + y^2 = 0$$

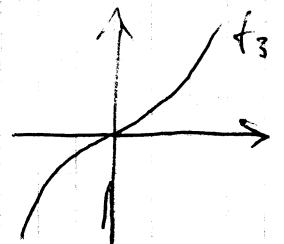
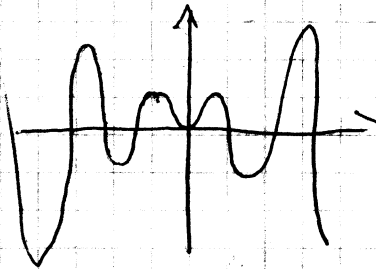
$$\left(x-\frac{1}{2}\right)^2 + y^2 = \frac{1}{4} \quad \text{Kreis } M\left(\frac{1}{2}|0\right) \quad r = \frac{1}{2}$$

P6 f_1 : bijektiv

f_2 : nicht surjektiv, injektiv

f_3 : surjektiv, injektiv \rightarrow bij.

f_4 : surjektiv



P7 freiwillig

1. Fall $i > 0$

$i^2 > 0$

$-1 > 0$

2. Fall

$i < 0 \Rightarrow 0 < -i$

$0 < (-i)^2$

$0 < -1$