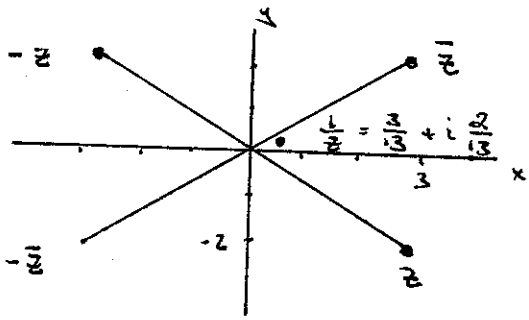
MATH 5331

S&S: 1.2

4)



7) a) Horizontal line $y = -2$

c) $|z - \frac{i}{2}| = 2$

Circle w/ radius 2 and center $(0, -\frac{1}{2})$

i) $|z - i| < 2$

Open Disk w/ radius 2 and center $(0, +1)$

8) $|z - 1| = |\bar{z} - 1|$

$|(x-1) + iy| = |(x-1) - iy|$

$= [(x-1)^2 + y^2]^{1/2}$

13) $(\bar{z})^2 \stackrel{?}{=} z^2$

$(x - iy)^2 \stackrel{?}{=} (x + iy)^2$

$(x^2 - y^2) - 2xyi = (x^2 - y^2) + 2ixy$

$x^2 - y^2 = x^2 - y^2$ ✓

$-2xy \stackrel{?}{=} 2xy$

Only if either $x = 0$ or $y = 0$.

-or-

$0 = z^2 - \bar{z}^2$

$0 = (z - \bar{z})(z + \bar{z})$

$0 = 2\,\mathrm{Im}(z) \cdot 2\,\mathrm{Re}[z]$

$\therefore$ Either $\mathrm{Re}[z] = 0$ or $\mathrm{Im}[z] = 0$