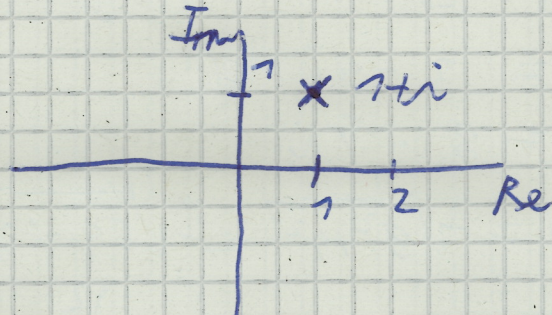
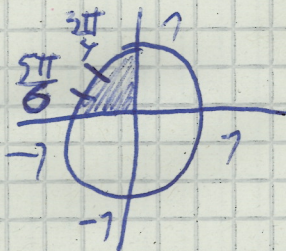


$$\begin{aligned}
 1) \quad z &= \frac{(1-i) \cdot (\sqrt{3} + i)}{1-i\sqrt{3}} = \frac{\sqrt{3} + i - \sqrt{3}i + 1}{1-i\sqrt{3}} = \\
 &= \frac{1-i\sqrt{3}}{1-i\sqrt{3}} + \frac{\sqrt{3}+i}{1-i\sqrt{3}} \cdot \frac{i}{i} = 1 + \frac{\sqrt{3}i + i^2}{i \cdot (1-i\sqrt{3})} = \\
 &= 1 + \frac{-\sqrt{3}i + 1}{i \cdot (-\sqrt{3}i + 1)} = 1 + \frac{-1}{i} \cdot \frac{i}{i} = 1 + \frac{-i}{-1} = \underline{\underline{1+i}}
 \end{aligned}$$

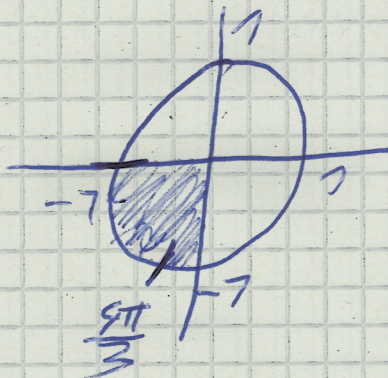


$$\begin{aligned}
 2) \quad z &= -2\sqrt{3} + 2i \\
 |z| &= \sqrt{(-2\sqrt{3})^2 + 2^2} = \sqrt{12 + 4} = \sqrt{16} = 4
 \end{aligned}$$



$$\begin{aligned}
 &-2\sqrt{3} + 2i \quad | \cdot \frac{1}{4} \\
 &-\frac{\sqrt{3}}{2} + \frac{1}{2}i \\
 \text{Gonv: } &4 \cdot \left( \cos \frac{5\pi}{6} + i \sin \frac{5\pi}{6} \right) \\
 \text{Exp: } &4e^{i \frac{5\pi}{6}}
 \end{aligned}$$

$$\begin{aligned}
 3) \quad z &= -\frac{7}{2} - \frac{\sqrt{3}}{2}i \\
 |z| &= \sqrt{\left(-\frac{7}{2}\right)^2 + \left(\frac{\sqrt{3}}{2}\right)^2} = \sqrt{\frac{49}{4} + \frac{3}{4}} = 7
 \end{aligned}$$



$$\begin{aligned}
 z &= 7 \cdot e^{i \frac{4\pi}{3}} \\
 z^3 &= e^{i \frac{32\pi}{3}}
 \end{aligned}$$



$$4) 3x^2 - 7x + 5 = 0$$

$$D = 49 - 4 \cdot 3 \cdot 5 = 49 - 60 = -11$$

$$x_{1/2} = \frac{7 \pm \sqrt{-11}}{2 \cdot 3} \quad \leftarrow \quad \frac{7 \pm i\sqrt{11}}{6}$$

$$6) z = (1-3i) \cdot \frac{6}{(2+2i)}$$

$$z = 2 + 2i - 6i - 6i^2$$

$$z = 2 - 4i + 6$$

$$z = 8 - 4i$$

$$|z| = \sqrt{8^2 + 4^2} = \sqrt{64 + 16} = \underline{\underline{4\sqrt{5}}}$$

$$7) z = 2i - 3i \cdot (1+2i)^2 - 4 \cdot (2-4i)$$

$$z = 2i - 3i \cdot (1+4i-4) - 8 + 16i$$

$$z = 2i - (-9i + 12i^2) - 8 + 16i$$

$$z = 2i + 9i + 12 - 8 + 16i$$

$$z = 4 + 27i$$

$$\bar{z} = \underline{\underline{4 - 27i}}$$

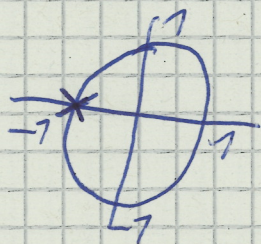
5)

$$x^8 = -1$$

$$x = \sqrt[8]{-1}$$

$$z = -1 + 0i$$

$$|z| = \sqrt{1+0} = 1$$



$$\varphi = \pi$$

$$x = 1^{\frac{1}{8}} \cdot e^{i \left( \frac{\pi + 2k\pi}{8} \right)}$$

$$0 \leq k \leq 7$$

$$x_1 = e^{i \frac{\pi}{8}}$$

$$x_2 = e^{i \frac{3\pi}{8}}$$

$$x_3 = e^{i \frac{5\pi}{8}}$$

$$x_4 = e^{i \frac{7\pi}{8}}$$

$$x_5 = e^{i \frac{9\pi}{8}}$$

$$x_6 = e^{i \frac{11\pi}{8}}$$

$$x_7 = e^{i \frac{13\pi}{8}}$$

$$x_8 = e^{i \frac{15\pi}{8}}$$