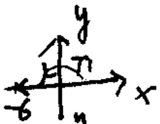
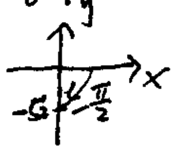
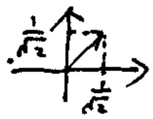
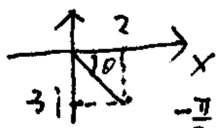
1. $-6 \Rightarrow$  $-6 = 6e^{i\pi}$

$-5i \Rightarrow$  $-5i = 5e^{-i\pi/2}$

$\frac{1+i}{\sqrt{2}} \Rightarrow$  $|z| = \sqrt{\frac{1+1}{2}} = 1$; $0 \le \theta \le \frac{\pi}{2}$

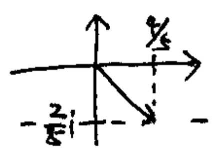
$\theta = \tan^{-1}\left(\frac{\frac{1}{\sqrt{2}}}{\frac{1}{\sqrt{2}}}\right) = \frac{\pi}{4}$ $\Bigg\} \Rightarrow \frac{1+i}{\sqrt{2}} = e^{i\pi/4}$

$2-3i$  $-\frac{\pi}{2} \le \theta \le 0$

$|z| = \sqrt{4+9} = \sqrt{13}$

$\theta = \tan^{-1}\left(-\frac{3}{2}\right) \simeq -0.98$

$z = \sqrt{13}\, e^{-0.98i}$

$\frac{2+i}{1+2i} = \frac{(2+i)(1-2i)}{(1+2i)(1-2i)} = \frac{4-3i}{5} \Rightarrow$  $-\frac{\pi}{2} \le \theta \le 0$

$|z| = \frac{\sqrt{16+9}}{\sqrt{25}} = 1$

$\theta = \tan^{-1}\left(-\frac{3}{4}\right) = -1.33$ $\boxed{z = e^{-1.33i}}$

2. (i) $z^3 = 1 = e^{i(0+2\pi n)}$ $n = 0, \pm1, \pm2 \ldots$

$z = \left[e^{i2\pi n}\right]^{1/3} = e^{i\frac{2\pi}{3}n}$

so we have an infinite number of roots, but just 3 of them are in the internal $-\pi < \theta \le \pi$

$z_1 = e^{i0} = 1$ $z_2 = e^{i2\pi/3} = \cos\left(\frac{2\pi}{2}\right) + i\sin\frac{2\pi}{3} = -\frac{1}{2} + \frac{i\sqrt{3}}{2}$

$z_3 = e^{-i2\pi/3} = \cos\left(\frac{2\pi}{3}\right) - i\sin\left(\frac{2\pi}{3}\right) = -\frac{1}{2} - \frac{i\sqrt{3}}{2}$