EE 3054 - Quiz 1 - Fall 2012

No calculators. No note sheets.

1. Convert to polar form

   (a) $-1 - \mathrm{j}$

   (b) $1 + \sqrt{3}\,\mathrm{j}$

   (c) $-\mathrm{j}$

2. Convert to rectangular form. Also, mark in the complex plane.

   (a) $\mathrm{e}^{\mathrm{j}\frac{\pi}{2}}$

   (b) $2\,\mathrm{e}^{-\mathrm{j}\pi}$

   (c) $3\,\mathrm{e}^{\mathrm{j}5\pi}$

   (d) $4\,\mathrm{e}^{\mathrm{j}\frac{\pi}{4}}$

   (e) $2\,\mathrm{e}^{-\mathrm{j}\frac{2}{3}\pi}$

3. Simplify in to polar form

   (a) $\mathrm{e}^{\mathrm{j}\frac{\pi}{2}} \cdot \mathrm{e}^{\mathrm{j}\frac{\pi}{4}}$

   (b) $2\,\mathrm{e}^{\mathrm{j}\frac{\pi}{2}} \cdot 3\,\mathrm{e}^{\mathrm{j}\frac{\pi}{3}}$

   (c) $\left(2\,\mathrm{e}^{\mathrm{j}\frac{\pi}{3}}\right)^2$

   (d) $\frac{1}{2\,\mathrm{e}^{\mathrm{j}\frac{\pi}{3}}}$

   (e) $\frac{1}{1+\mathrm{j}}$

   (f) $\left(4\,\mathrm{e}^{\mathrm{j}\frac{\pi}{4}}\right)^*$ (complex conjugate)

4. Simplify in to rectangular form

   (a) $\frac{1}{1+\mathrm{j}}$

   (b) $(1 + 2\,\mathrm{j})\,(-2 + \mathrm{j})$