1. **Signal Classification:** For each signal below determine whether it is (i) continuous-time or discrete-time and (ii) analog or digital. Clearly and explicitly justify your answers for full credit.
   (a) \( x(n) = 2|n|, \ n = 0, \pm 1, \pm 2, \ldots \)
   (b) \( x(t) = e^{jt}, \ t \in \mathbb{R} \)
   (c) \( x(t) = \lceil 2t \rceil, \ t \in \mathbb{R}^+, \) where \( \lceil \cdot \rceil \) is the ceiling function

2. **Signal Models:** Sketch and numerically label the following functions:
   (a) \( x(t) = -u(1-2t) \)
   (b) \( x(t) = \delta(1-2t) \)
   (c) \( x(t) = \delta(t-1) + u(-1-t). \)

3. **Properties of Impulse Functions:** Simplify the following expressions:
   (a) \( (t+4) \delta(t+3) \)
   (b) \( \cos(t) [\delta(t-\pi) + \delta(t+\pi)] \)
   (c) \( \sum_{k=0}^{\infty} 2^{-t} \delta(t-k). \)

4. **Impulse Functions and Integrals:** Evaluate the following integrals:
   (a) \( \int_{-\infty}^{\infty} \arctan(\tau) \delta(\tau-1) \ d\tau \)
   (b) \( \int_{-\infty}^{t} \arctan(\tau) \delta(\tau-1) \ d\tau \)
   (c) \( \int_{t}^{\infty} \arctan(\tau) \delta(\tau-1) \ d\tau. \)

5. **Rectangular/Polar Forms of Complex Numbers:** For each complex number below, compute either its rectangular form or its polar form (whichever is missing) and plot the point in the complex plane.
   (a) \( 2 - j2 \)
   (b) \( -1 - j4 \)
   (c) \( 0.5e^{j3\pi} \)
   (d) \( 3e^{-j5\pi/4} \)