1. B.2 Express the following numbers in polar form:
   \[ 1 + j \]
   \[ -4 + 3j \]
   \[ (1 + j)(-4 + 3j) \]
   \[ e^{\frac{j\pi}{4}} + 2e^{-\frac{j\pi}{4}} \]
   \[ e^{j} + 1 \]
   \[ (1 + j)/( -4 + 3j) \]

2. B.3 Express the following numbers in Cartesian form:
   \[ 3e^{\frac{j\pi}{4}} \]
   \[ 1/e^{j} \]
   \[ (1+j)(-4+j3) \]
   \[ e^{\frac{j\pi}{4}} + 2e^{-\frac{j\pi}{4}} \]
   \[ e^{j} + 1 \]
   \[ 1/2^{j} \]

3. B.22. Use MATLAB to produce the following plots. Include your MATLAB code and the resulting figures. Make sure to label the figures.
   a) \[ x_{1}(t) = \text{Re}(2e^{(-1+j2\pi)t}) \]
   b) \[ x_{2}(t) = \text{Im}(3 - e^{(1-j2\pi)t}) \]
   c) \[ x_{3}(t) = 3 - \text{Im}(e^{(1-j2\pi)t}) \]

4. B.23 Use MATLAB to plot \[ x(t) = \cos(t)\sin(20t) \] over a suitable range of t.

5. B.36 Using MATLAB’s residue command compute the partial fraction expansions of the following rational functions. See the example in the book on how to use the ‘residue’ function in MATLAB or do ‘help residue’.
a) \[ H_1(s) = \frac{s^2 + 5s + 6}{s^3 + s^2 + s + 1} \]

b) \[ H_2(s) = \frac{1}{H_1(s)} \]

c) \[ H_3(s) = \frac{1}{((s + 1)^2 (s^2 + 1))} \]

d) \[ H_4(s) = \frac{s^2 + 5s + 6}{3s^2 + 2s + 1} \]