1. For each circuit below, find the following:
   (a) \( z \) as a logical function of \( x \) and \( y \)
   (b) truth table showing \( x, y \) as inputs and \( z \) as an output. You may find it useful to generate rows for \( p \) and \( q \) as intermediate variables.

   [Diagrams of circuit #1 and circuit #2]

2. Draw logic circuits that realize the following logic functions,
   (a) \( z = xy + x'y' \) (\( x, y \) are inputs; \( z \) is output)
   (b) \( w = xyz + y(x'z + x'(y'z')) \)
      (\( x, y, z \) are inputs; \( w \) is the output)
   (c) \( w = (x+y+z)(xy'+z')(x+y'z) \)
      (\( x, y, z \) are the inputs; \( w \) is the output)

3. For the circuits in Problem 1, determine the waveform for \( z \), if \( x \) and \( y \) waveforms are as follows:

   [Waveforms for \( x \) and \( y \) with time intervals]