1. For problems a, b give the contents of any affected memory or register locations.
   a. (2 pts) decf 0x05C, f
      
      \[0x5C = (0x05C) - 1 = 0x29 - 1 = 0x28\]
      
      new value of location 0x5C is 0x28

   b. (2 pts) movwf 0x59
      
      copy the contents of W to location 0x59, so new value of location 0x59 is 0xB2.

2. Do the following:
   a. (3 pts) Assuming a 10 MHz clock cycle, how long does it take the following instructions to execute? (give the answer in NANOSECONDS. Recall that 1 MHz = 1 e6 frequency, and has period = 1 e-6 = 1 µs = 1000 ns).

      \[
      \begin{array}{ll}
      \text{inst} & \text{cycles} & \text{clk cycles} \\
      \text{movf} & 0x004, f & 1 & 4 \\
      \text{subwf} & 0x00A, w & 1 & 4 \\
      \end{array}
      \]
      
      10 MHz clock has 1/10 period of 1 MHz clock, so 10 MHz period is 1000ns/10 = 100 ns. Total time is 8 clks * 10 ns = 800 ns.

   b. (3 pts) Convert the instruction ‘movf 0x13C, f’ to machine code. Use our previously stated assumptions about the setting of the access (‘a’) bit.

      \[
      \begin{array}{ll}
      \text{movf} & 0x13C, f \quad 0101 \ 00da \ \text{ffff} \ \text{ffff} \\
      \end{array}
      \]
      
      = 0x533C (d = 1 because destination is f),
      
      (a = 1, because 0x13C is not in access bank, must use BSR)
      
      note only the last 8 bits of 0x13C is encoded in the instruction.