4. A. # of peak groups = # of equivalent H types
   B. Chemical shift = proximity to various e- withdrawing groups - chemical environment of each proton
   C. Integration - relative proportion of each kind of equivalent hydrogen
   D. Splitting - number of neighbors
      - equivalent neighbors
      - non-equivalent neighbors
      - geminal protons on an alkene are non-equivalent, but splitting is tiny and may not be observed
      - splitting by protons cis or trans to one another across a double bond is large

5.

6. IR: $\lambda_{max} > 3000 \text{ cm}^{-1}$
   no -OH, -NH, C=O

   MS: Bromine! $M^+ = 170/172$
   $7 \times 12C = 84$
   $7 \times 1H = \frac{7}{91}$ base peak
   C7H7Br = 4 degrees of unsaturation

   'H-NMR - Benzene! + a CH2 group < DEPT
   'H-NMR - Benzene! + one other kind of H, probably immediately attached to the benzene (~4.3 ppm)
   Integration: ~ 5:2
   Splitting - lots @ 7.3 ppm (messy overlap)
   Singlet @ 4.3 ppm - the CH2 has no neighbors