Computer Architecture HW5

1. a. down
   b. up
   c. down
   d. down
   e. down

2. $4KiB = 2^{12}B$

   $43 - 12 = 31$

   a. 2^{31}

   b. $4 * 2^{31} = 8GBit = 2^{33}bits$

3. a. $32Bblock = 2^5Bblocks$

   $8KB = 2^{13}B = 2^8blocks$

   offset: 5
   index: 8
   tag: $32 - 13 = 19$

   b. $2^{64-13} = 2^{51}$

4. $CPI \ 1.0 = \frac{1}{4e9} = 0.25e^{-9} = 0.25ns$

   $\frac{0.25+50*0.02}{0.25+0.02*5+0.005*50} = \frac{1.25}{0.6} \approx 2.08$

5. A:

   $0.03125 * (5 + 180 * 0.003) \ vs \ 0.03125 * (20 + 180 * 0.0012) \Rightarrow 0.173125 \ vs \ 0.63175 \Rightarrow Private \ Win$

   B: $0.03125 * (5 + 180 * 0.0006) vs 0.03125 * (20 + 180 * 0.0003) \Rightarrow 0.16 vs 0.62669 \Rightarrow Private Win$