1. Let $A$ and $B$ be events in the sample space $S$ and suppose $P(A) = 0.7$, $P(B) = 0.4$ and $P(A \cap B) = 0.2$. Find
   
   (a) $P(S)$
   (b) $P(A \cup B)$
   (c) $P(A - B)$
   (d) $P(A \cup B^c)$

2. A coin is thrown four times and the number of heads is counted.
   (a) Find the sample space $S$.
   (b) Find the probability of each of the outcomes.

3. A coin is tossed repeatedly. From class the probability the first head appears on the $n$th toss is $2^{-n}$. Find the probability the first head appears (write your answers as simplified fractions)
   (a) on the 5th toss
   (b) before the 5 toss
   (c) after the 5th toss
   (d) on a toss divisible by 5