Name

SHOW AS MUCH WORK AS POSSIBLE BECAUSE YOU MAY RECEIVE PARTIAL CREDIT FOR THE WORK YOU DO IF YOUR ANSWER IS INCORRECT.

1. A man with blood type *AB* and a woman with blood type *A* just had a baby daughter with blood type *B*.
   a. What are the genotypes of the parents?
      Man: AB Woman: AO
   b. What is the genotype of the daughter?
      BO
   c. What is the probability that their next child will have blood type *A*?
      $P(A) = \frac{2}{4} = 0.5$
   d. What is the probability that their next child will have blood type *O*?
      $P(O) = \frac{0}{4} = 0$
   e. What is the probability that their next child will also be a daughter with blood type *B*? $P(\text{girl with blood type B}) = \frac{1}{8} = 0.125$
   f. If their next child has blood type *A*, what is the probability that the child has the same genotype as the mother?
      $P(AO \mid A) = \frac{1}{2} = 0.5$

2. For a person selected at random, let E be the event: "has blood type *A*," let F be the event: "has at least one *O* allele," and let G be the event: "has identical (*ABO*) blood type alleles." For each of the following compound events, list all the genotypes that it includes:
   $E = \{AA, AO\}$ $F = \{AO, BO, OO\}$ $G = \{AA, BB, OO\}$
   a. $E \cap F = \{AO\}$
   b. $E \cup F = \{AA, AO, BO, OO\}$
   c. $G - E = \{BB, OO\}$
   d. $G - F = \{AA, BB\}$
   e. $G - (E \cup F) = \{BB\}$
   f. $(G - E) \cap (G - F) = \{BB\}$