3. Bob and Ann are members of a committee that is made up of ~~four~~ men and five women. Four of the nine are to be chosen to serve as officers. If the officers are to be chosen randomly, what is the probability

4pts

a) all four officers will be women?

$$= \frac{C(5,4)}{C(9,4)} = \boxed{\frac{5}{126}}$$

4pts

b) at least three officers are women?

$$\frac{C(5,3)\cdot C(4,1) + C(5,4)}{C(9,4)} = \frac{40+5}{126} = \frac{45}{126} = \boxed{\frac{5}{14}}$$

4pts

c) all four officers are women given that at least three officers are women?

$$P(4W \mid \geq 3W) = \frac{P(4W)}{P(\geq 3W)} = \frac{5/126}{45/126} = \frac{5}{45} = \boxed{\frac{1}{9}}$$

4pts

d) Ann is selected?

$$\frac{C(1,1)\cdot C(8,3)}{C(9,4)} = \frac{56}{126} = \frac{28}{63} = \boxed{\frac{4}{9}}$$

4pts

e) Bob is selected if we know that Ann is selected?

$$P(B \mid A) = \frac{P(B \cap A)}{P(A)} = \frac{C(1,1)C(1,1)C(7,2)/C(9,4)}{56/126} = \frac{21/126}{56/126} = \boxed{\frac{3}{8}}$$

4. A student is studying to pass a competency exam in German. Each time she takes the exam she has a 40 % chance of passing, and she is allowed a maximum of three attempts.

4pts

a) Draw a tree diagram to represent her attempts to pass the exam.