BIOL 368-001: Class 3 Homework

Given 27/01/2010, Due 02/01/2010

1. The cystic fibrosis disease is a terminal illness that is caused by a recessive cystic fibrosis gene. Among Caucasian newborns, about 1 in 1700 suffer from the disease. How many Caucasians are healthy carriers of the cystic fibrosis gene? (Hint: Use the Hardy-Weinberg law.)

2. In humans, females have two X chromosomes, whereas males have only one, inherited from their mother, and one Y chromosome, inherited from their father. A gene that appears on the X chromosome but not on the Y is said to be X-linked, and is always expressed in males (regardless of whether it is dominant or recessive). A common form of color-blindness affects about 1 in 20 Caucasian males, and is caused by a recessive allele of an X-linked gene. Estimate the frequency of this kind of color-blindness among Caucasian females. (Hint: this is not a difficult calculation. You just have to think clearly about what the question is telling you.)