Q1. Nearsightedness is a recessive trait. If two nearsighted parents (male and female) give birth to four children, how many will be nearsighted?

B. All

Q2. If an egg of a worm contains 6 chromosomes, it comes from a worm that has _____ chromosomes in each body cell

C. 12

Q3. In humans pointed eyebrows are dominant to smooth eyebrows and widow's peak (downward pointed frontal hairline) is dominant to continuous hairline. What phenotypic ratio would you expect in the offspring from a cross between an individual heterozygous for both genes and an individual homozygous recessive for both genes?

C. 1:1:1:1

Q4. Case Study (pages 37-38). Answer the <u>three questions</u> on page 38.

1. Since Sean and Michelle are both carriers of the CF gene, any one of their children has a 25% chance of having CF. Therefore, the probability that two of their children have F is 25% * 25* = 6.25%.
2. Since only one of the parents carry the G551D mutation, any child will have 50% chance of carrying the mutation. Since Molly already has it, the chances that both children will carry it is 50% * 50% = 25%.
3. She should remember the CF mutations she has, and she should get her partner's medical history checked for any mutations of CF, because if both of them have or are carriers of CF and have a child, there is a high chance that one of their children will have it as well.

Q5. Case Study (page 87). Answer the three questions.

1. The chances of the child not having the cancer mutation is 50%, and the chances of the child not having the heart mutation is 50%, so the chances of the child not having both is 50% * 50% = 25% or ¼. No these are not good odds, because it means the child has a 75% chance of having ONE of the two diseases.
2. Yes, I would, and yes it is their responsibility because if they are not prepared to undertake the burden that the diseases carry (financial burden, living adjustments, constant care throughout the course of the child's life, frequent doctor visits) they may want to re-consider having a child or even consider adoption.
3. If only one of the two parents carried a disease (either heart or cancer in this case), I would continue with having a child, but if both have some diseases, then no, I would not, because in my opinion it is unfair to give birth to a child that will have diseases and will have a difficult life simply for the sake of having a child. Adoption would be considered as well.

Q6. A man's grandfather has galactosemia, a rare autosomal recessive disease caused by the inability to process galactose, leading to muscle, nerve, and kidney malfunction. The man married a woman whose sister had galactosemia. The woman is now pregnant with their first child.
a. Draw the pedigree as described.

b. What is the probability that this child will have galactosemia?

1/12

c. If the first child does have galactosemia, what is the probability that a second child will have it?

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