Answer to the questions #43280, Biology, Other

A young couple has been arguing about their son who has O blood type, meanwhile they are having A and B blood type. What might explain this outcome?

A. the husband is homozygotic B and his wife is heterozygotic A
B. The husband is heterozygotic A and his wife is heterozygotic B
C. the husband is heterozygotic B and his wife is homozygotic A
D. the husband is heterozygotic B and his wife is heterozygotic A
E. both of B and D are correct

Answer: The correct answer is E

♂ AO x ♀ BO	♀ AO x ♂ BO
↓	↓
1 AO1	1 AO
1 BO	1 BO
1 OO	1 OO
1 AB	1 AB

Homozygotic son (OO) could be born in families B and D with the probability ¼ (probability to get allele O from both parents is ½, thus probability of the zygote (genotype and phenotype in the case of co-dominance) is a product of the probabilities of both gametes (½ x ½). As these traits are not sex-linked it does not matter which parent has A or B allele. Thus, both cases are equiprobable.