1. In guinea pigs, rough coat (R) is dominant over smooth coat (r). A rough-coated guinea pig is bred to a smooth one, giving eight rough and seven smooth-coated progeny in the F1s. What are the genotypes of the two parents? Work out the cross please using the R and r symbols. Guinea pigs are diploid.

**Smooth-coated parent has to be rr. Rough-coated parent is either RR or Rr.**

If parent is RR, then RR X rr should give all Rr progeny in F1s, or in other words, all rough-coated progeny in F1s. This does not happen.

If parent is Rr, then Rr X rr should give Rr : rr progeny in 1:1 ratio or rough : smooth in 1:1 ratio. 8 rough : 7 smooth is close to 1:1.

So parental genotypes are Rr and rr.

2. Man A has brown teeth. He marries Woman B who has normal teeth. All their daughters have brown teeth, but all their sons have normal teeth. The sons of Man A and Woman B marry women with normal teeth, and all their children have normal teeth. All the daughters of Man A and Woman B marry men with normal teeth, but half their children have brown teeth.

Man A is passing on the brown teeth gene to all his daughters but not his sons. This is typical of a sex-linked trait (criss-cross inheritance), and in this case has to be X-linked. Since the daughters all express the trait, and NONE of the sons do, this has to be dominant.