Create a pedigree for the family described in the story below. Be sure to use the proper symbols and connections to accurately portray this family. Label each character with the appropriate name and genotype for the trait of interest. Shade each circle or square to reflect the proper genotype. Do this twice, treating the trait as a complete dominance situation and then as a sex-linked situation. Being tail-less is the normal dominant phenotype. Use the letter ‘T’ for the normal allele and ‘t’ for the tailed allele. In the Sex-Linked scenario ONLY: shade half-way to indicate being a carrier.

Zeke worked for the circus and fell in love with LuAnne, who sold tickets. What the younger LuAnne didn’t know was that Zeke was actually a sideshow act because he had a tail. Not just a stump, but a true tail that he kept hidden except when he was on stage. LuAnne never saw his act and he told her that he was one of the elephant trainers. They dated for a full year when he proposed, but when he finally did, he had to tell his little secret. She said that it didn’t matter and that she loved him because he was a good, honest person.

In the years to come they had 4 children. They had two girls (Lulu was first followed by Chloe), and then two boys: Zeke Jr. and finally Lucas. With the first three children, they were relieved to see that none of their children had a tail, so they thought it was a fluke and would never show up again. However when Lucas was born with a tail, they knew it had to be genetic. They debated whether or not to have it removed but decided that this could be a moneymaker for the circus if both father and son possessed a tail.

The lives of the family were happy ones and they grew up in the circus surrounded by people who cared very much for each other. Chloe never married, but Lulu married one of the clowns named Shaky (who was normal for the tail trait). They had 3 normal girls named Petunia, Daisy, and Rosy.

Zeke Jr. didn’t marry but Lucas fell in love with Yolanda the pretzel lady. She didn’t sell pretzels but she could turn herself into one. Lucas and Yolanda had three kids named Florida, Georgia, and Tennessee (since those were the states where each one was born). The first two were girls and the last was a boy. None of these children were born with tails.

Petunia married the son of the Ringmaster, Thorsten, which was like marrying into royalty among circus-folk. Soon after the wedding, his father retired and Thorsten took over as Ringmaster. They had three children: two identical twin girls (Maddy was the first born, Paddy was second), and a boy named Jerome. Much to the surprise of the Ringmaster, Jerome was born with a tail. Thorsten considered this a disgrace to his family and divorced Petunia and left the circus to become the manager at McDonald’s. Petunia lived quite happily with her three children and the rest of her family in the circus.
Florida (the oldest daughter of Lucas) married a lion-tamer named Lance. Lance and Florida had two sons: first Leo, and then two years later they had Felix. Although neither Florida nor Lance had a tail, Felix did. Lance claimed that the lion’s blood coursed through his veins because he was a lion-tamer and that is why his son was born this way. Following in his proud father’s footsteps, Felix became famous as the first lion-tamer with a ‘lion’s tail’!

**Post Pedigree Question:**

1. How many generations are present in the pedigree you created?

2. Did the lay-out of the pedigree change depending on whether the trait is X-linked or autosomal? Explain why or why not.

**Complete Dominance Pedigree:**

3. What must be LuAnne’s genotype? How do you know?

4. What are Petunia’s and Thorsten’s genotypes? How do you know?

5. Where there any individuals for which you could not definitively determine the genotype? If so, who? Explain why this is so.

**Sex-Linked (X-Linked) Pedigree:**

6. What is Shaky’s genotype? Why do you know it now, unlike with the complete dominance scenario?

7. List all the carriers. Besides genotype, what do they all have in common?

8. If a boy has a tail, which parent passed it on to him? How do you know this?

9. Is there any individuals for whom you could not definitively determine the genotype? If so, who?

10. Felix is very proud of his tail and he searched the world over until he met a girl with a tail named Nala. He married her and they had three boys and 1 girl. Can you determine what the likelihood of them having a child with a tail would be? Show your work to support your answer.