Use the chart to identify the genotypes of the following traits:

1. Heterozygous round eyes, blue body ________
2. Hybrid eye shape, purebred roundpants ________
3. Purebred roundpants, heterozygous long nose ________

SpongeBob’s aunt, who is a roundpants, has a cute stubby nose. She has finally found the sponge of her dreams and is ready to settle down. Her fiancé always comments on how adorable her nose is (he says it reminds him of his mother’s – aww, how sweet!). They wonder what the chances are of that trait being passed on. Her fiancé is a purebred squarepants and has purebred long nose.

4. Identify the genotypes of the aunt and her fiancé.
   Aunt –  Roundpants, Stubby Nose = ________
   Fiancé –  Purebred Squarepants, Long Nose = ________

5. What are the possible gamete combinations for each person? Aunt – ________ Fiancé – ________

6. What are the possible genotypes for their children? ______________________________________

7. What are the genotypes of SpongeBob, who is heterozygous for his yellow body color and his squarepants, and his wife SpongeSusie, who is blue and has roundpants?
   SpongeBob = ________   SpongeSusie = ________

8. What are the possible gamete combinations for each person?
   SpongeBob = ________________   SpongeSusie = ________

9. Complete the Punnett square based on the information provided in #7-8 and then answer the questions.

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What is the chance of a blue baby? ________
What is the chance of a squarepants? ________
What is the chance of a blue squarepants? ________
What is the chance of a purebred recessive for both traits? ________
10. In starfish, pink body color (P) is dominant to orange (p), and thick eyebrows (T) are dominant over thin (t) ones. Patrick, who is heterozygous for body color but purebred for thick eyebrows, has met Patti, who is recessive for both traits.

What is Patti’s phenotype? _______________________________

Is it possible for the new couple to have offspring that resemble their mother? Explain. ____________________________________________________________

11. Before Patrick commits to this relationship, he would like to guarantee that his offspring would have his thick eyebrows. (He thinks they make him smarter!) You need to provide evidence for or against the marriage. This question regards eyebrows ONLY.

12. While Squidward’s family boasts about being a purebred line for dominant light blue skin color, they are also purebred for a less distinguished trait: the recessive trait of baldness. Lack of hair causes Squidward some self-esteem issues that he does not want his children to face. He would like to ensure that his offspring have hair AND with his blue skin color. What traits should he look for in a bride?

Must she have hair? Explain. ____________________________________________________________

Must she be blue? Explain. ____________________________________________________________

13. Squidward has found a potential bride prospect with the green squid Octavia. While Octavia has hair, her father does not. Determine the chances of their child being blue and having hair.

Squidward = ________  Octavia = ________

14. Use the genotypes in #13 to complete the Punnett square below and then answer the questions.

For which traits, if any, is it possible for their offspring to be purebred?

What is the probability of their children being heterozygous for both traits? ________