

THE secret ANSWER AREA

1. In African-violet plants, purple flowers are dominant to white flowers. You purchase an African-violet plant with white flowers. Its genotype could be represented as :

- A. PP
- B. Pp
- C. pP - (*this is the same thing as choice "B"*)

D. pp - ORGANISMS WITH RECESSIVE TRAITS MUST BE HOMOZYGOUS RECESSIVE (2 lowercase letters)

2. To discover whether an animal showing the dominant trait is homozygous or heterozygous, it must be crossed with an animal that is:

- A. homozygous dominant
- B. homozygous recessive - RULE #1 FOR A TEST CROSS**
- C. heterozygous
- D. choices B & C

3. Two tall pea plants are crossed, producing 105 tall plants & 32 short plants. The genotypes of the tall parent plants are:

- A. Tt & Tt - BOTH PARENT ORGANISMS MUST CARRY ONE RECESSIVE ALLELE IN ORDER TO PRODUCE RECESSIVE ORGANISMS**
- B. TT & Tt - (*no short plants would be produced from this cross*)
- C. Tt & tt - (*the "tt" parent would be short, the questions says both parents are tall --- can't be an answer*)
- D. tt & tt - (*both parents were tall, can't be an answer*)

4. A spotted dalmation is mated with a pure-white dalmation (ss) to determine whether its genotype is SS or Ss for spots. Three puppies are born, all with spots. We can conclude that the spotted dalmation is SS.

- A. true
- B. false - 3 PUPPIES IS NOT REALLY A LARGE ENOUGH NUMBER OF OFFSPRING TO BE 100% CERTAIN THAT THE DALMATION IS "DD"**

5. In mice brown (B) is dominant to white (b). A brown mouse is mated with a white mouse. Twelve brown mice are produced. The brown mouse's genotype is:

- A. BB - ALL DOMINANT OFFSPRING INDICATE THAT THE UNKNOWN GENOTYPE IS HOMOZYGOUS DOMINANT, 12 IS A LARGE ENOUGH LITTER**
- B. Bb - (*this would produce some white mice*)
- C. bb - (*"bb" would make the brown mouse white, can't be an answer*)
- D. a reliable conclusion can't be reached

6. Two brown-eyed parents have a child with blue eyes. The best explanation is:

- A. a mutation occurred before the child was born
- B. both parents carry the allele for blue eyes**
- C. both parents are pure for brown eyes
- D. they wore blue contacts during sexual intercourse - (*that's just silly*)

7. Which scenario best supports the conclusion that a black guinea pig's genotype is homozygous dominant?

- A. after mating with a white guinea pig, 2 black & 2 white guinea pigs were produced - (*recessive offspring would mean the parent is hybrid*)
- B. after mating with a white guinea pig, 10 black & 8 white guinea pigs were produced - (*recessive offspring would mean the parent is hybrid*)
- C. after mating with a white guinea pig, 12 black guinea pigs were produced**
- D. after mating with a black guinea pig, 4 black guinea pigs were produced - (*a correct test cross would be with a white guinea pig*)

8. Individuals with the same phenotype have the same genotype.

- A. true
- B. false - AN ORGANISM WITH A DOMINANT PHENOTYPE CAN BE EITHER HOMOZYGOUS DOMINANT OR HETEROZYGOUS FOR THAT TRAIT**

9. In a test cross to determine whether a fruit fly is homozygous (WW) or heterozygous (Ww) for long wings, 7 long-winged flies & 1 short winged-fly are produced. Which is a valid conclusion?

- A. the unknown fruit fly is WW
- B. the unknown fruit fly is Ww - THE APPEARANCE OF ANY OFFSPRING WITH THE RECESSIVE TRAIT INDICATES THAT THE UNKNOWN GENOTYPE IS HYBRID**
- C. the unknown fruit fly is ww
- D. more offspring are needed

10. In hamsters, long tails (L) are dominant to short tails (l). A student wishes to perform a test cross to determine whether a female long-tailed hamster is homozygous or heterozygous for tail length. She mates the hamster with a male long-tailed hamster & studies the offspring, which are 100% long-tailed. She concludes that the female hamster's genotype is "LL". What mistake(s) did the student make?

- A. she should have mated the female hamster with a male that was known to be hybrid
- B. she should have mated the female hamster with a short-tailed male hamster - A TEST CROSS ALWAYS INVOLVES CROSSING WITH AN ORGANISM THAT HAS THE RECESSIVE PHENOTYPE**
- C. she should have mated the female hamster with another long-tailed female
- D. she has to mate members of the litter before she can make a conclusion

