

## Probability in Forensics Answers

Loci	# Alleles (n)	# Combinations	Probability of each combination
D3S1358	8	36	1/36 or 0.028
vWA	11	66	1/66 or 0.015
FGA	14	105	1/105 or 0.010
Amelogenin*	2	2	1/2 or 0.5
D8S117	12	78	1/78 or 0.013
D21S11	22	253	1/253 or 0.004
D18S51	21	231	1/231 or 0.004
D5S818	10	55	1/55 or 0.018
D13S317	8	36	1/36 or 0.028
D7S820	10	55	1/55 or 0.018

2. \*Amelogenin is a special case since it detects the X and Y chromosome. Although one would expect 3 combinations, there are only 2. Why?

XX is a female, XY is a male, but YY is a lethal combination that doesn't exist

3. If a match is made between a suspect and a blood stain on the wall, what are the odds of this event happening by chance alone? (Hint: This uses the multiplicative law) (Note: This assumes that each allele is equally frequent in the population)

$$= 1/36 \times 1/66 \times 1/105 \times 1/2 \times 1/78 \times 1/253 \times 1/231 \times 1/55 \times 1/36 \times 1/55$$

$$= 1 / 2.48 \times 10^{17} \text{ or } 4.04 \times 10^{-18}$$