Problem Set 1 (contd) (due 2/15/23)

③ c) contd

Genotype	count
AA	1
AG	7
GG	2

obs. genotype freq

AA 1/10 = 0.1

AG 7/10 = 0.7

GG 2/10 = 0.2

obs. allele freq

A $\frac{2(1)+7}{20} = \frac{9}{20} = 0.45$

G $\frac{2(2)+7}{20} = \frac{11}{20} = 0.55$

HWE expectations

$p = 0.45$

$q = 0.55$

AA $p^2 = 0.2025$

AG $2pq = 0.495$

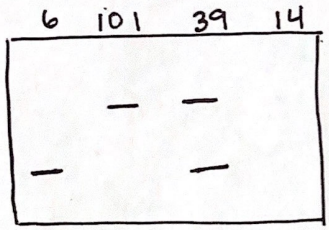
GG $q^2 = 0.3025$

$$\chi^2 = \frac{(0.1-0.2025)^2}{0.2025} + \frac{(0.7-0.495)^2}{0.495} + \frac{(0.2-0.3025)^2}{0.3025}$$

$\chi^2 = 0.1715...$

$\chi^2 < 3.84$ which is still small enough ~~variation~~ variation to be seen by chance

④ a) "Heterozygotes for a null allele & another allele appear to be "homozygotes" - p. 106



phenotype A B AB O

genotype I_AI_A I_BI_B I_AI_B I_oI_o I_AI_o I_BI_o

exp. freq. p^2+2pr q^2+2qr $2pq$ r^2

Thinking about this problem like blood types example.

~~$p^2 + 2pr + q^2 + 2qr + 2pq + r^2 = 1$~~

~~$p^2 + 2pq + q^2 = (p+q)^2 = 1$~~

~~$p^2 + 2pr$~~