(3)

(4)

A cross: $(p+q) \times (p+q) =$

	p	q
p	pp	pq
q	pq	qq

pop = 100% or 1

p, q ; p+q = 1 given 2 alleles form UNITY.

$pp + 2pq + qq = 1$ — simplify it!

$p^2 + 2pq + q^2 = 1$ — factor it!

$(p+q)(p+q) = 1$ — representing mating of 2 heterozygotes = UNITY, pop

.25 × .25 = .0625

$p^2 = 0.25$ → if $p = 0.5$, $q = 0.5$

established (p) based on population info + math

If $p+q=1$, $p = 1-q$ and $q = 1-p$

$pp = p^2$ $qq = q^2$ $(pq)(pq) = 2pq$

etc (you are given p^2, take √, do 1−p to get q)

H-W IN Nature, all conditions of H-W are almost never met. The case of sickle cell anemia (heterozygote advantage = malarial resistance) meets all but selective advantage + random mating

See H/O for solution

Continue to last H/O's

Say

Speciation mechanisms are complex | Geo + Breeding Isolation — physical separation

coevolution 2 species develop to coexist intimately in same niche

convergent evo - 2 species independently evolve to look the same

divergent evo - 2 species become more + more dissimilar over time

adaptive radiation - one isolated "point source" for species evo

artificial selection - man imposes selective environ pressure to isolate desired traits. Ex Bacteria in Lab, dog breeds in field

gradualism vs punct equilib - these are obvs / don't explain how

selective pressures

genetic drift / founder effect / bottleneck - all will cause some gene freqs to go up + some to go down in a pop.