BO 1099
Help Session

Genetics Problem Solving Session Tuesday Sep 2nd:

Q2:

red x red → all red
white x white → all white
red x white → all roan
roan x roan → ¼ red : ½ roan : ¼ white

a) Incomplete Dominance of alleles
b) red x red → all red
R^1R^1 R^1R^1 R^1R^1

white x white → all white
R^2R^2 R^2R^2 R^2R^2

roan x roan →
R^1R^2 R^1R^2

	R^1	R^2
R^1	R^1R^1	R^1R^2
R^2	R^2R^1	R^2R^2

1:2:1

Q4:

Male parent: blood type B whose mother was type O
Genotype: I^BI^O ← glycoproteins
Female parent: blood type A whose father was type B
Genotype: I^AI^O

Offspring:

♀ \ ♂

	I^B	I^O
I^A	I^AI^B	I^AI^O
I^O	I^BI^O	I^OI^O

Ratio = 1:1:1:1

Q5:

	P	p
P	~~PP~~	Pp
p	Pp	pp

Ratio = 2:1

The P allele is behaving recessively in the case of lethality, but dominantly in the case of platinum coat color.
or
codominantly

Q 8: A_B_ (gray) ; A_bb (yellow)
aaB_ (black) ; aabb (cream)

a) AAbbCC x aaBBcc

	AbC
aBc	AaBbCc

All will be gray

b) AaBBcc x AABbcc

	ABc	aBc
ABc	AABBcc	AaBBcc
Abc	AABbcc	AaBbcc

All are albino

c) AaBbCc x AaBbcc

	ABC	ABc	AbC	Abc	aBC	abc	abC
ABc	~~AABBCc~~	~~AABBcc~~	AABbCc	~~AABbcc~~	~~AaBBCc~~	~~AaBBcc~~	~~AaBbCc~~
Abc	~~AABbCc~~	~~AABbcc~~	AAbbCc	AAbbcc	~~AaBbCc~~	~~AaBbcc~~	~~AabbCc~~
aBc	~~aABBCc~~	~~aABBcc~~	~~AaBbCc~~	~~AaBbcc~~	~~aaBBCc~~	~~aaBBcc~~	~~aaBbCc~~
abc	~~AaBbCc~~	~~AaBbcc~~	~~AaBbCc~~	~~AabbCc~~	~~aaBbCc~~	~~aabbcc~~	aabbCc

12 albino ratio 12:9:3:3:1
9 gray
3 yellow
3 ~~black~~ black
1 cream

Q 10:

a)

	X	Y
X_A	X_AX	X_AY
X	XX	XY

Probability = 1/4 for normal son

b) Probability = 1/2

c) Probability = 1/4

d) 0

Q 13:

	X_B	Y
X_B	X_BX_B	X_BY
X_b	X_BX_b	X_bY

1/4 black female 1/4 black male

1/4 tortoiseshell female 1/4 orange male

O Probability of a tortoiseshell male

Q 23: autosomal recessive mutations for tan eye color (r1, r2, r3)

Cross 1: r1 x r2 → F_1: all wild type eyes

Complementation: these are not the same alleles

Cross 2: r1 x r3 → F_1: all tan eyes

same alleles

Cross 3: r2 x r3 → Predicted F_1: all wild type eyes

Q 24: Chestnut → C^1C^1 Pal: C^2 Cremello

Cremello → C^2C^2

Palimino → C^1C^2

	C^1	C^2
C^1	C^2C^1	1/2 Palimino
C^2	C^2C^2	1/2 Cremello

Chestnut

Pal	C^1	
C^1	C^1C^1	1/2 chestnut
C^2	C^2C^1	1/2 palimino

Palimino x Palimino

	C^1	C^2
C^1	C^1C^1	C^1C^2
C^2	C^2C^1	C^2C^2

1:2:1